

No. 11019

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United States
Circuit Court of Appeals

For the Ninth Circuit.

THE PERMANENTE METALS CORPORA-
TION, a corporation,

Appellant,

vs.

B. PISTA AND MARIE PISTA,

Appellees.

Transcript of Record

In Two Volumes

VOLUME I

Pages 1 to 375

Upon Appeal from the District Court of the United States
for the Northern District of California,

Southern Division

FILED

SEP 8 - 1945

PAUL P. O'BRIEN,

CLERK

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[Clerk's Note: When deemed likely to be of an important nature, errors or doubtful matters appearing in the original certified record are printed literally in *italic*; and, likewise, cancelled matter appearing in the original certified record is printed and cancelled herein accordingly. When possible, an omission from the text is indicated by printing in *italic* the two words between which the omission seems to occur.]

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NAMES AND ADDRESSES OF ATTORNEYS

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1060 Mills Tower,
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San Francisco, California.

BARDIN and HARRINGTON,

615 Salinas National Bank Building,
Salinas, California,

Attorneys for Plaintiff and Appellee.

In the Superior Court of the State of California
In and For the County of Monterey

No. 23317

B. PISTA and MARIE PISTA,

Plaintiffs,

vs.

THE PERMANENTE METALS CORPORA-
TION, a corporation,

Defendant.

State of California,
County of Monterey—ss.

I, Emmet G. McMenamin, County Clerk and ex-officio Clerk of the Superior Court of the State of California, in and for the County of Monterey, do hereby certify that the annexed and foregoing copies constitute a true, correct and complete transcript of all proceedings in the above-entitled cause, including the—

Complaint

Summons

Petition for Removal of Cause to the United States District Court, for the Northern District of California, Southern Division

Bond on Removal

Notice of Petition for Removal

Order for Removal of Cause

Affidavit of Service by Mail

Notice of Order for Removal of Cause to the United States District Court

as fully as the same remain of record and on file in my office, and that said copies are full, true and

correct copies of the originals thereof, and of the whole thereof.

Witness my hand and the Seal of said Court this 30th day of November, 1943.

[Seal]

EMMET G. McMENAMIN,

Clerk

By EDNA E. SHORNE

Deputy [*2]

[Title of Superior Court and Cause.]

NOTICE OF ORDER FOR REMOVAL OF
CAUSE TO THE UNITED STATES DIS-
TRICT COURT

To the Plaintiffs Above-Named, and to Messrs.
Bardin and Harrington, Their Attorneys:

You, and each of you, will please take notice, that on Tuesday, the 9th day of November, 1943, the above-entitled court made its order approving defendant's bond on removal in the above-entitled matter, and ordering the removal of said action to the United States District Court, for the Northern District of California, Southern Division. Attached hereto is a copy of said order.

MAX THELEN

THOMAS K. McCARTHY

THELEN, MARRIN, JOHNSON
& BRIDGES,

Attorneys for Defendant.

[Endorsed]: Filed Nov. 12, 1943. [3]

[Title of Superior Court and Cause.]

ORDER FOR REMOVAL OF CAUSE

The Permanente Metals Corporation, a corporation, defendant herein, having, on the 9th day of November, 1943, and within the time provided by law, filed its petition with the above-entitled court for the removal of this cause into the District Court of the United States, in and for the Northern District of California, Southern Division, and having at the same time offered its bond in the sum of One Thousand Dollars (\$1,000.00), with Hartford Accident & Indemnity Company, a corporation, a good and sufficient surety, pursuant to the statute, and conditioned according to law; now, therefore,

It is Hereby Ordered that said petition and bond be accepted and approved, and that this cause be removed to the District Court of the United States, in and for the Northern [4] District of California, Southern Division, pursuant to the statutes of the United States; that the Clerk of this Court be, and he hereby is, directed forthwith to make up the record in this action for the transmission of the same to the said District Court of the United States, and that this Court proceed no further in the suit.

Dated this 9th day of November, 1943.

H. G. JORGENSEN

Judge of the Superior Court

[Endorsed]: Filed Nov. 9, 1943. [5]

[Title of Superior Court and Cause.]

AFFIDAVIT OF SERVICE BY MAIL

State of California,

City and County of San Francisco—ss.

Bena Edwards, being first duly sworn, says:

That she is a citizen of the United States and a resident of the City and County of San Francisco, State of California; that her business address is 111 Sutter Street, San Francisco, California; that she is over the age of eighteen years, and not a party to the above-entitled action.

That the office of Messrs. Bardin and Harrington, the attorneys for plaintiffs, is located at 615 Salinas National Bank Building, Salinas, California; that the office of Messrs. Thelen, Marrin, Johnson & Bridges, the attorneys for defendant, is located at 111 Sutter Street, San Francisco, California.

That on November 10, 1943, affiant deposited in the United States mail box at 111 Sutter Street, San Francisco, California, a sealed envelope addressed to Messrs. Bardin and [6] Harrington, 615 Salinas National Bank Building, Salinas, California, containing a true and correct copy of Notice of Order for Removal of Cause to the United States District Court; that the original of said Notice is filed herewith; that postage was fully prepaid on said envelope; that there is a regular communication by United States mail between the place of mailing and the place so addressed.

BENA EDWARDS

Subscribed and sworn to before me this 10th day of November, 1943.

[Seal]

LULU P. LOVELAND

Notary Public, in and for the City and County of San Francisco, State of California.

(Here Follows Copy of Order for Removal of Cause Already Copied.)

Filed 1943 Nov. 9 AM 10 06 Emmet G. McMenamin County Clerk. Agnes Koue Deputy.

[Endorsed]: Filed Nov. 12, 1943. [7]

[Title of Superior Court and Cause.]

NOTICE OF PETITION FOR REMOVAL

To the Plaintiffs Above-Named, and to Messrs. Bardin and Harrington, Their Attorneys:

You are hereby notified that on Tuesday, the 9th day of November, 1943, the defendant, The Permanente Metals Corporation, a corporation, will file in the above-entitled court, in the City of Salinas, County of Monterey, its petition and bond for the removal of the above-entitled cause from the said court to the United States District Court, for the Northern District of California, Southern Division. Copies of said petition and bond are attached hereto and [8] made a part hereof.

Dated ths 8th day of November, 1943.

MAX THELEN

THOMAS K. McCARTHY

THELEN, MARRIN, JOHNSON

& BRIDGES

Attorneys for Petitioner, The Permanente Metals
Corporation

Receipt of a copy of the within notice, together
with copies of petition for removal of cause and
copy of bond on removal, is hereby acknowledged,
this 9th day of November, 1943.

BARDIN & HARRINTON, V.S.

Attorneys for Plaintiffs

[Endorsed]: Filed Nov. 9, 1943. [9]

[Title of Superior Court and Cause.]

PETITION FOR REMOVAL OF CAUSE TO
THE UNITED STATES DISTRICT
COURT, FOR THE NORTHERN DISTRICT
OF CALIFORNIA, SOUTHERN DIVISION

To the Honorable Superior Court of the State of
California, In and For the County of Monterey:

The verified petition of The Permanente Metals
Corporation, a corporation, respectfully shows as
follows, to-wit:

I.

That the complaint in the above-entitled action
was filed with the Superior Court of the State of
California, in and for the County of Monterey. on

the 13th day of October, 1943, and that thereupon summons was issued and service of said summons and complaint was accepted by this corporate defendant on the 16th day of October, 1943, in the City and [10] County of San Francisco, State of California, and that the time for said defendant to answer or plead to said complaint does not expire until the 15th day of November, 1943.

II.

That the amount and matter in dispute in the above-entitled cause between plaintiffs and defendant exceeds the sum of \$3,000.00, exclusive of interest and costs, and is the sum of \$40,000.00.

III.

That the controversy in this suit is, and at the time of the commencement of this suit was, wholly between citizens of different states; that petitioner, The Permanente Metals Corporation, the defendant in this suit, was at the time of the commencement of this suit, and ever since has been, and still is, a corporation organized and existing under and by virtue of the laws of the State of Delaware, and is a citizen of the State of Delaware, within the meaning and intent of the statutes of the United States relating to diversity of citizenship as grounds for jurisdiction in the Federal courts.

That petitioner, The Permanente Metals Corporation, is not organized or incorporated in the State of California, and is not a citizen of said State, and plaintiffs, B. Pista and Marie Pista, and each of

them, were, at the time of the commencement of this suit, and still are, citizens and residents of the State of California, and that the controversy herein is between citizens of different states.

V.

That prior to the filing of this petition, petitioner, The Permanente Metals Corporation, a corporation, gave notice to plaintiffs above-named of the filing of this petition and the [11] bond for removal of said cause from the above-entitled court to the United States District Court, for the Northern District of California, Southern Division.

VI.

That petitioner offers herewith a bond with good and sufficient surety for its entering into the said United States District Court, within thirty days from and after the filing hereof a certified copy of the record in the above-entitled action, and for the payment of costs that may be awarded by said United States District Court, for the Northern District of California, Southern Division, if said court shall hold that said suit was wrongfully or improperly removed thereto.

Wherefore, petitioner prays that this court proceed no further herein, except to make such order of removal as may be required by law and to accept the said surety and bond, and to cause the record herein to be removed to said District Court of the

United States, for the Northern District of California, Southern Division.

MAX THELEN

THOMAS K. McCARTHY

THELEN, MARRIN, JOHNSON
& BRIDGES

Attorneys for Petitioner, The Permanente Metals Corporation. [12]

State of California,

County of Alameda—ss.

G. G. Sherwood, being first duly sworn, says:

That he is an officer of defendant and petitioner herein, The Permanente Metals Corporation, a corporation, to-wit, Treasurer and Assistant Secretary thereof, and that he makes this verification on its behalf.

That he has read the within and foregoing petition and knows the contents thereof, and that the same is true of his own knowledge, except as to the matters which are therein stated on information or belief, and as to those matters that he believes it to be true.

G. G. SHERWOOD

Subscribed and sworn to before me this 8th day of November, 1943.

[Seal]

NELLIE I. PHILLIPS

Notary Public In and For the County of Alameda,
State of California.

(Here Follows Copy of the Bond on Removal Which Is Copied Hereafter.) [13]

[Title of Superior Court and Cause.]

BOND ON REMOVAL

Know All Men by These Presents:

That we, the undersigned, The Permanente Metals Corporation, a corporation, as principal, and the Hartford Accident & Indemnity Company, a corporation, organized and existing under and by virtue of the laws of the State of Connecticut, as surety, authorized to transact and transacting a surety business in the State of California, as a surety company, are held and firmly bound unto B. Pista and Marie Pista, and their executors, administrators and assigns, in the sum of One Thousand Dollars (\$1,000.00), lawful money of the United States of America, for the payment of which well and truly to be made we bind ourselves, our, and each of our, successors and assigns, jointly and severally, by these presents.

The condition of the above obligation is such that,

Whereas, The Permanente Metals Corporation, a corporation, named as the defendant in the above-entitled cause, [14] has filed its petition in the Superior Court of the State of California, in and for the County of Monterey, for the removal of that certain action therein pending, which is above-entitled, to the United States District Court, for the Northern District of California, Southern Division;

Now, if said petitioner, The Permanente Metals Corporation, a corporation, shall file in said United States District Court, for the Northern District of

California, Southern Division, within thirty days from the date of the filing of said petition for removal, a certified copy of the record in said cause, and shall pay all the costs that may be awarded by said United States District Court, if said Court shall hold that said suit was wrongfully or improperly removed thereto, then this obligation to be void, otherwise to be and remain in full force and effect.

Witness our hands and seals, this 8 day of November, 1943.

THE PERMANENTE METALS
CORPORATION,

a Corporation,

By E. E. TREFETHEN, Jr.

Vice-President

By G. G. SHERWOOD

Assistant Secretary

Principal

[Seal]

HARTFORD ACCIDENT & IN-
DEMNITY COMPANY,

a Corporation,

By JAMES A. SMITH,

Attorney-in-Fact

Executed in duplicate.

Surety

The above and foregoing bond is accepted and the form thereof approved, and the surety approved as good and sufficient, this 9th day of November, 1943.

H. G. JORGENSEN

Judge of the Superior Court

State of California,

City and County of San Francisco—ss.

On this 8 day of November in the year one thousand nine hundred and 43, before me, Vincent P. Laguens, a Notary Public in and for said City and County, residing therein, duly commissioned and sworn, personally appeared James A. Smith, known to me to be the Attorney-in-Fact of the Hartford Accident and Indemnity Company, the Corporation described in and that executed the within instrument, and also known to me to be the person who executed it on behalf of the Corporation therein named, and he acknowledged to me that such Corporation executed the same.

In Witness Whereof, I have hereunto set my hand and affixed my Official Seal, at my office, in the said City and County of San Francisco, the day and year in this certificate first above written.

[Seal] Vincent P. Laguens

Notary Public In and For the City and County of
San Francisco, State of California.

My Commission will Expire Dec. 30, 1946 [16]

State of California,

County of Alameda—ss.

On this 8th day of November, in the year One Thousand Nine hundred and forty-three, before me, Nellie I. Phillips, a Notary Public in and for the County of Alameda, State of California, residing therein, duly commissioned and sworn, personally appeared E. E. Trefethen, Jr., known to me to be the Vice-President, and G. G. Sherwood, known

to me to be the Assistant Secretary of the Corporation that executed the within instrument and the officers who executed the within instrument on behalf of the Corporation therein named, and acknowledged to me that such Corporation executed the same.

In Witness Whereof, I have hereunto set my hand and affixed my Official Seal, the day and year in this certificate first above written.

[Seal]

NELLIE I. PHILLIPS

Notary Public In and For said County of Alameda,
State of California.

(Here Follows Petition for Removal of Cause to the United States District Court, for the Northern District of California, Southern Division Already Copied.)

[Endorsed]: Filed Nov. 9, 1943. [17]

[Title of Superior Court and Cause.]

SUMMONS

Action brought in the Superior Court of the State of California, in and for the County of Monterey, and the Complaint filed in the office of the County Clerk of said County of Monterey.

Bardin and Harrington,

615 Salinas National Bank Bldg.,
Salinas, Calif.

Attorney for Plaintiff.

The People of the State of California To:

The Permanente Metals Corporation, a corporation,
Defendant:

You are hereby directed to appear, and answer the Complaint in an action entitled as above, brought against you in the Superior Court of the State of California, in and for the County of Monterey, within ten days after the service on you of this Summons—if served within this County; of within thirty days if served elsewhere.

And you are hereby notified that unless you appear and answer as above required, the said Plaintiff will take judgment for any money or damages demanded in the Complaint, as [18] arising upon contract, or will apply to the Court for any other relief demanded in the Complaint.

Given under my hand and Seal of the Superior Court of the County of Monterey, State of California, this 13th day of October, A.D. 1943.

[Seal] EMMET G. MENAMIN,
Clerk

By JOSEPHINE QUATRINI
Deputy Clerk.

[Endorsed]: Filed Nov. 26, 1943. [18]

[Title of Superior Court and Cause.]

COMPLAINT

Plaintiffs complain of defendant and for cause of action allege:

1.

That the defendant is now and was at all times hereinafter mentioned a corporation.

2.

That plaintiffs are now, and were at all times hereinafter mentioned, the owners of the following described real property, situate in the County of Monterey, State of California, to-wit:

All that certain piece or parcel of land, situate in the County of Monterey and State of California, bounded and more particularly described as follows, to wit:

Being a part of the Natividad Rancho and beginning at the West side of the old Los Angeles Stage road, on the line between the land now or formerly of Henry Cowell and [20] lands now or formerly of S. Ollason on the Natividad Rancho; thence along a fence North 70 degrees and 15 minutes West 23.10 chains to the South-west corner of said Henry Cowell's land; thence South 35 degrees West 27.82 chains to a stake in a corner of a fence marked W. J.; thence South 26 degrees and 35 minutes East 9.00 chains to the West bank of the Gabilan Creek; thence crossing the Creek, South 83 degrees East 3.31 chains to the West side of the old Stage road thence following the West side of the road the fol-

lowing courses and distances: North 23 degrees East 4.66 chains; North 59 degrees and 30 minutes East 6.86 chains; North 74 degrees East 7.13 chains; North 18 degrees and 15 minutes East 1.00 chains; North 35 degrees and 30 minutes East 1.00 chain; North 46 degrees and 30 minutes East 1.92 chains; North 70 degrees and 45 minutes East 3.30 chains; South 87 degrees and 45 minutes East 1.00 chain; South 77 degrees and 30 minutes East 4.79 chains; North 26 degrees and 50 minutes East 8.56 chains; North 16 degrees and 20 minutes East 2.98 chains to the place of beginning, and containing 56.29 acres.

3.

That plaintiffs have now, and for more than fifteen (15) years last past have had, a valuable orchard on said premises, consisting of approximately fifty (50) acres of apricot trees and apple trees; that in addition to said orchard plaintiffs have also planted said premises to crops of beans and other vegetables.

4.

That defendant is the owner or lessee of certain real property situate about one-half mile distant from the lands of plaintiffs hereinbefore described; that on or about the 1st day of August, 1942, defendant constructed a large plant upon said property for the purpose of treating dolomite ore and as a part of said plant constructed large kilns and smoke stacks; that for more than one year last past defendant has almost daily fed into said kilns dolomite ore in great quantities; that through said kilns

and smoke stacks heated air and gases pass at the rate of many thousands of feet per minute; that as a result of the operations of defendant in said plant, large quantities [21] of dolomite dust, to the extent of twenty (20) tons per day or more, have passed through said smoke stacks daily, and thereafter, through the action of the winds and force of gravity, have been distributed over the surrounding territory, including plaintiffs' aforesaid premises.

5.

That an almost continuous shower of dolomite dust, emanating from defendant's aforesaid plant and caused by its operation, is, and for more than one year last past has been, falling upon the aforesaid premises of plaintiffs covering and coating the ground, forming a semi-cemented encrustation upon the upper sides of all foliage, and leaving ineradicable evidence of dust, dusty deposits, and grayish colorings resulting therefrom, upon the apricots and other fruits grown upon said premises.

6.

That the deposit of said dolomite dust upon said trees, as aforesaid, has greatly reduced the productivity of said orchard and has decreased the value of the fruit grown thereon; that plaintiffs are informed and believe, and therefore allege, that unless defendant is restrained and enjoined from depositing dolomite dust upon said orchard that said orchard will become worthless.

7.

That by reason of the aforesaid acts of defendant, plaintiffs lost practically their entire crop of apricots during the season of 1943, and plaintiffs will be obliged to expend large sums of money in order to remove the dolomite dust from said trees.

8.

That the acts of defendant are unlawful, and if it is permitted to continue its acts aforesaid, great and irreparable injury will be done plaintiffs; that plaintiffs have already [22] sustained damages from the acts aforesaid in the sum of Forty Thousand and no/100 (\$40,000.00) Dollars.

Wherefore, plaintiffs pray judgment for said sum of Forty Thousand and no/100 (\$40,000.00) Dollars damages and costs of suit. And they further pray that a permanent injunction be issued against the defendant, restraining and enjoining it from permitting dolomite dust from its plant to blow over and upon plaintiffs' premises. Plaintiffs pray for general relief.

BARDIN AND HARRINGTON
Attorneys for Plaintiffs

State of California

County of Monterey—ss.

B. Pista, being first duly sworn, deposes and says that: he is one of the plaintiffs in the foregoing Complaint named; that he has read and knows the contents thereof and that the same is true, except as to the matters and things therein stated to be on

information and belief, and as to those matters and things, he believes it to be true.

B. PISTA

Subscribed and sworn to before me this 13th day of October, 1943.

[Seal] J. T. HARRINGTON

Notary Public in and for the County of Monterey,
State of California.

[Endorsed] Filed Dec 7 1943 C. W. Calbreath,
Clerk.

[Endorsed]: Filed Oct. 13, 1943.

In the District Court of the United States in and
for the Northern District of California, South-
ern Division

No. 22983-R

B. PISTA and MARIE PISTA,

Plaintiffs,

vs.

THE PERMANENTE METALS CORPORA-
TION, a corporation,

Defendant.

ANSWER

Comes now defendant, The Permanente Metals Corporation, a corporation, and answering the complaint herein, admits, denies and alleges as follows:

I.

Answering paragraph 2 of said complaint, defendant is without knowledge or information sufficient to form a belief as to the truth of said averment, and basing its denial upon such lack of knowledge or information, denies each and every, all and singular the allegations of said paragraph 2.

II.

Answering paragraph 3 of said complaint, defendant is without knowledge or information sufficient to form a belief as [24] to the truth of said averment, and basing its denial upon such lack of knowledge or information, denies each and every, all and singular the allegations of said paragraph 3.

III.

Answering paragraph 4, defendant denies each and every, all and singular the allegations of said paragraph, commencing with the word "that" in line 31, page 2, and ending with the word "premises" in line 5, page 3.

IV.

Defendant denies each and every, all and singular the allegations of paragraphs 5, 6, 7 and 8. Defendant denies that plaintiffs have been damaged in the sum of \$40,000.00, or in any other sum.

Wherefore, defendant prays judgment that plaintiffs take nothing by their said complaint; that their prayer for a permanent injunction be denied; and

that defendant have judgment for its costs of suit herein incurred.

MAX THELEN

THOMAS K. McCARTHY

THELEN, MARRIN, JOHN-
SON & BRIDGES

Attorneys for Plaintiff [25]

State of California

County of Alameda—ss.

E. E. Trefethen, Jr., being first duly sworn, says:

That he is an officer of defendant herein, The Permanente Metals Corporation, a corporation, to-wit, vice-president thereof, and that he makes this verification on its behalf.

That he has read the within and foregoing answer, and knows the contents thereof, and that the same is true of his own knowledge, except as to the matters which are therein stated on information or belief, and as to those matters that he believes it to be true.

E. E. TREFETHEN, Jr.

Subscribed and sworn to before me this 11th day of December, 1943.

[Seal]

PAUL E. ROGERS

Notary Public in and for the County of Alameda,
State of California.

(Acknowledgement of Receipt of Copy)

[Endorsed]: Filed Dec. 11, 1943. C. W. Calbreath, Clerk. [26]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the Southern Division of the United States District Court for the Northern District of California, held at the Court Room thereof, in the City and County of San Francisco, on Tuesday, the 12th day of September, in the year of our Lord one thousand nine hundred and forty-four.

Present: the Honorable Michael J. Roche, District Judge.

[Title of Cause.]

TRIAL WITHOUT JURY

This case came on regularly this day for trial before the Court sitting without a jury. George Naus, Esq. and J. F. Harrington, Esq. were present on behalf of the plaintiffs, and Courtney Moore, Esq. and Thomas K. McCarthy, Esq. were present on behalf of the defendant. Mr. Naus made an opening statement. B. Pista and William Lewis were sworn and each testified on behalf of the plaintiffs. Mr. Naus introduced in evidence and filed Plaintiffs' Exhibits Nos. 1 and 2, and offered a certain exhibit which was marked Plaintiffs' Exhibit No. 3 for Identification. It is Ordered that this case be continued to September 13, 1944, for further trial. [27]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the Southern Division of the United States District Court for the Northern District of California, held at the Court Room thereof, in the City and County of San Francisco, on Wednesday, the 13th day of September, in the year of our Lord one thousand nine hundred and forty-four.

Present: the Honorable Michael J. Roche, District Judge.

[Title of Cause.]

TRIAL RESUMED

The parties hereto being present as heretofore, the further trial of this case was this day resumed. F. T. Twining and Louis Pista were sworn and testified on behalf of the plaintiffs. Mr. Naus introduced in evidence and filed Plaintiffs' Exhibits Nos. 4, 5, and 6, and the plaintiff rested. Mr. Moore introduced in evidence and filed Defendant's Exhibits A to G, inclusive. L. H. Duschak was sworn and testified on behalf of the defendant. It is Ordered that this case be continued to September 14, 1944, for further trial. [28]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the Southern Division of the United States District Court for the Northern District of California, held at the Court Room thereof, in the City and County of San Francisco, on Thursday, the 14th day of September, in the year of our Lord one thousand nine hundred and forty-four.

Present: the Honorable Michael J. Roche, District Judge.

[Title of Cause.]

TRIAL RESUMED

The parties hereto being present as heretofore, the further trial of this case was this day resumed. L. H. Duschak was recalled and gave further testimony on behalf of the defendant. Mr. Naus offered certain exhibits which were marked Plaintiffs' Exhibits Nos. 7, 10 and 11 for identification. Mr. Naus introduced in evidence and filed Plaintiffs' Exhibits 8 and 9. Mr. Moore introduced in evidence and filed Defendant's Exhibits H, I, J and K. It Is Ordered that this case be continued to September 15, 1944, for further trial. [29]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the Southern Division of the United States District Court for the Northern District of California, held at the Court Room thereof,

in the City and County of San Francisco, on Friday, the 15th day of September, in the year of our Lord one thousand nine hundred and forty-four.

Present: the Honorable Michael J. Roche, District Judge.

[Title of Cause.]

TRIAL RESUMED

The parties hereto being present as heretofore, the further trial of this case was this day resumed. J. J. Wilmoth, William Eipper, and J. M. Garoutte were sworn and each testified on behalf of the defendant. L. H. Duschak was recalled and gave further testimony on behalf of the defendant. Mr. Moore introduced in evidence and filed Defendant's Exhibit L. Mr. Naus offered certain exhibits which were marked Plaintiffs' Exhibits Nos. 12, 13, 14, 15 and 16 for identification. It is Ordered that this case be continued to September 20, 1944, for further trial. [30]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the Southern Division of the United States District Court for the Northern District of California, held at the Court Room thereof, in the City and County of San Francisco, on Wednesday, the 20th day of September, in the year of our Lord one thousand nine hundred and forty-four.

Present: the Honorable Michael J. Roche, District Judge.

[Title of Cause.]

TRIAL RESUMED

The parties hereto being present as heretofore, the further trial of this case was this day resumed. Fred Lohse and Walter Packard were sworn and each testified on behalf of the defendant. Mr. Moore introduced in evidence and filed Defendant's Exhibits M, O, T, U, V and Y, and offered certain exhibits which were marked Defendant's Exhibits N, P, Q, R, S, W and X for identification. Leo Anderson was sworn and testified on behalf of the plaintiff. Mr. Naus offered a certain exhibit which was marked Plaintiffs' Exhibit No. 17 for identification. It Is Ordered that this case be continued to September 21, 1944, for further trial. [31]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the Southern Division of the United States District Court for the Northern District of California, held at the Court Room thereof, in the City and County of San Francisco, on Thursday, the 21st day of September, in the year of our Lord one thousand nine hundred and forty-four.

Present: the Honorable Michael J. Roche, District Judge.

[Title of Cause.]

TRIAL RESUMED
ORDERED BRIEFS FILED

The parties hereto being present as heretofore, the further trial of this case was this day resumed. Walter Packard was recalled and gave further testimony on behalf of the defendant. Mr. Moore introduced in evidence and filed Defendant's Exhibit N-1 and offered a certain exhibit which was marked Defendant's Exhibit Z for identification, and the defendant rested. Max Miller was sworn and testified on behalf of the plaintiffs in rebuttal. F. T. Twining and Wm. Lewis were recalled and gave further testimony on behalf of the plaintiffs and both sides rested. It is Ordered that briefs be filed in 15, 15 and 15 days. Further Ordered that this case be continued to November 7, 1944, for further trial. [32]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the Southern Division of the United States District Court for the Northern District of California, held at the Court Room thereof, in the City and County of San Francisco, on Monday, the 6th day of November, in the year of our Lord one thousand nine hundred and forty-four.

Present: the Honorable A. F. St. Sure, District Judge.

[Title of Cause.]

ORDER SUBMITTING CASE

On motion of Geo. Naus, Esq., on behalf of the plaintiff, it is Ordered that this case stand submitted. [33]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the District Court of the United States for the Northern District of California, Southern Division, held at the Court Room thereof, in the City and County of San Francisco, on Tuesday, the 28th day of November, in the year of our Lord one thousand nine hundred and forty-four.

Present: the Honorable Michael J. Roche, District Judge.

[Title of Cause.]

JUDGMENT ORDERED—INJUNCTION
DENIED

It is Ordered that judgment be entered herein in favor of the plaintiffs and against the defendant in the sum of \$9,903.84, together with costs, upon findings of fact and conclusions of law. It is further Ordered that the application for injunction be and the same is hereby denied without prejudice. [34]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the District Court of the United States for the Northern District of California, Southern Division, held at the Court Room thereof, in the City and County of San Francisco, on Tuesday, the 12th day of December, in the year of our Lord one thousand nine hundred and forty-four.

Present: the Honorable Michael J. Roche, District Judge.

[Title of Cause.]

DEFENDANT'S PROPOSED AMENDMENTS TO FINDINGS OF FACT, etc.
OVERRULED—JUDGMENT ENTERED

It is Ordered that the defendant's proposed amendments to the findings of fact and conclusions of law be overruled, and that a judgment be filed and entered in favor of the plaintiffs and against the defendant in the sum of \$9,903.84, with costs, in accordance with the findings of fact and conclusions of law this day filed. [35]

[Title of District Court and Cause.]

FINDINGS OF FACT

The Court finds the following to be the facts:

I. Continuously from a date prior to the commencement of this action (a) the plaintiffs have been citizens of the State of California, and (b) de-

fendant has been a corporation incorporated under the laws of the State of Delaware. The matter in controversy exceeds, exclusive of interest and costs, the sum of \$3,000.00.

II. Plaintiffs are the owners of the real property described in paragraph 2 of their complaint and it consists of a ranch of approximately 56 acres, of which 44 acres comprise an apricot orchard which has been in full commercial bearing since approximately the year 1922. The exterior boundary of said orchard [36] nearest the stacks hereinafter mentioned is approximately half a mile therefrom and the farthest exterior boundary is approximately one mile from said stacks.

III. In the Natividad district, in Monterey County, California, the defendant has operated continuously since August 4, 1942, a dolomite quarry and calcine plant, the latter consisting of two rotary kilns in which crushed dolomite ore from said quarry is calcined at a temperature sufficiently high to expel from said ore the carbon dioxide therein, which is expelled in the form of a stream of hot gas into the atmosphere through two stacks, one to each of said kilns. Said stream of gas carries with it into the atmosphere extremely fine particles, i.e., dust, from said crushed ore. From the commencement of the operation, as aforesaid, in August, 1942, until a year thereafter, in August, 1943, said dust was discharged out of said stacks into the atmosphere at an average rate of approximately 32 tons daily. In August, 1943, defendant installed as a part of said operation a mechanism known as a Cottrell

precipitator, and since that installation the quantity of dust discharged from said stacks into the atmosphere has been reduced to a daily average of approximately 4 or 5 tons.

IV. Said dust, after discharge into the atmosphere, falls upon the ground and the vegetation thereon within a roughly circular area having a radius of approximately 3 miles from said stacks.

V. The dustfall, as aforesaid, was continuous upon said orchards of plaintiffs throughout the whole of the apricot blossoming time therein in the early part of the year 1943, and as a proximate result thereof caused said apricot orchard to yield 133.475 tons of apricots less than the yield would have been otherwise. Said apricots had a market value of \$74.20 a ton, net after deduction of all harvesting, packing, shipping and selling expenses; and the plaintiffs were therefore damaged by said dustfall in the amount of \$9,903.84. [37]

VI. The dustfall in said orchard has been adding the ingredients of dolomite ore to the soil of said orchard, cumulatively, but the evidence does not show that either the soil or the trees of said orchard are, or have been, injured thereby thus far. The end product of the operations of defendant is metallic magnesium, a war material. Injunctive relief should not be granted at the present time.

CONCLUSIONS OF LAW

1. An injunction should be denied, without prejudice.

2. Plaintiffs should have and recover the sum of \$9,903.84 of and from defendant, with costs of suit taxed in the sum of \$428.50.

Dated December 12th, 1944.

MICHAEL J. ROCHE

United States District Judge.

(Acknowledgement of Receipt of Copy)

[Endorsed]: Filed Dec. 12, 1944. [38]

In the District Court of the United States in and
for the Northern District of California, South-
ern Division.

No. 22983-R

B. PISTA and MARIA PISTA,

Plaintiffs,

vs.

THE PERMANENTE METALS CORPORA-
TION, a corporation,

Defendant.

JUDGMENT

This matter having come on regularly for trial of the issues of fact raised by the complaint and answer, and the matter having been regularly tried on September 12, 13, 14, 15, 20 and 21, and regularly submitted for decision, and the Court having made and filed Findings of Fact and Conclusions of Law, and good cause appearing, it is

Adjudged:

1. That an injunction is hereby denied, without prejudice.

2. That plaintiffs have an recover of and from defend- [39] ant the sum of \$9,903.84, with costs of suit taxed in the sum of \$428.50.

Dated December 12th, 1944.

MICHAEL J. ROCHE

United States District Judge.

(Acknowledgement of Receipt of Copy)

[Endorsed]: Filed Dec. 12, 1944. [40]

[Title of District Court and Cause.]

NOTICE OF INTENTION TO MOVE

FOR A NEW TRIAL

To B. Pista and Marie Pista, plaintiffs and to George M. Naus, Bardin & Harrington, their attorneys:

You and each of you will please take notice that the defendant intends to move the above entitled court to vacate and set aside the decision of the court rendered in the above entitled action and to grant a new trial of said cause, upon the following grounds, materially affecting the substantial rights of the defendant, to-wit:

I.

Excessive damages appearing to have been given under the influence of passion or prejudice; [41]

II.

Insufficiency of the evidence to justify the decision of the court in that no material evidence produced justifies a decision of the court relative to the damages. That all the evidence which was produced was mere opinion, surmise and conjecture and does not justify the decision of the court relative to damages;

III.

Error in law occurring at the trial and excepted to by the defendant;

IV.

The decision is against law in that the evidence which was given and the statements of the court show that an injunction was denied for the reason as stated by the court that there is no evidence that after the installation of a dust precipitator, that the orchard of the plaintiff was in any way injured after such installation. That the findings of fact as signed by the court are not based upon such lack of evidence, but are contrary to the evidence and carry the inference that said injunction was denied due to the fact that the dolomite plant of the defendants was being used in an essential war industry; and

V.

Error of law in that the finding of the court from which the injunction was denied is contrary to the evidence.

Dated: December 21, 1944.

THELEN, MARRIN, JOHN-
SON & BRIDGES

COURTNEY L. MOORE

Attorneys for Defendant

(Acknowledgment of Receipt of Copy.)

[Endorsed]: Filed Dec. 21, 1944. [42]

[Title of District Court and Cause.]

NOTICE OF MOTION HEREIN TO MOVE
FOR NEW TRIAL

To B. Pista and Marie Pista, plaintiffs and to
George M. Naus, Bardin & Harrington, their
attorneys:

The defendant in the above entitled action having herewith filed his notice of intention to move for a new trial, hereby gives notice that said defendant will move the above entitled court on Tuesday, January 2, 1945 for a new trial, and also will move the above entitled court that the judgment be opened and a new decision be rendered by striking out paragraph VI of said findings and inserting in lieu thereof the following:

VI. That after the installation of the mechanism known as the Cottrell Precipitator, and which precipitator was in operation during the 1944 crop season, the plaintiff had the second largest crop in the history of his orchard, namely, 450 tons; that said

fruit for the year 1944, with the Cottrell [43] Precipitator in operation, was not injured or damaged by any dust deposit on the fruit, on the trees, or on the ground; and the evidence does not show either the soil or the trees of said orchard are or have been injured thereby so far.

Dated: December 21, 1944.

THELEN, MARRIN, JOHN-
SON & BRIDGES

COURTNEY L. MOORE

Attorneys for Defendant

(Acknowledgment of Receipt of Copy.)

[Endorsed]: Filed Dec. 21, 1944. [44]

District Court of the United States, Northern
District of California, Southern Division

At a Stated Term of the District Court of the United States for the Northern Division of California, Southern Division, held at the Court Room thereof, in the City and County of San Francisco, on Tuesday, the 2nd day of January, in the year of our Lord one thousand nine hundred and forty-five.

Present: the Honorable Michael J. Roche, District Judge.

[Title of Cause.]

MOTION FOR NEW TRIAL DENIED—10 DAY
STAY OF EXECUTION ON JUDGMENT

This case came on regularly this day for hearing

of motion for a new trial. After hearing the arguments of Courtney Moore, Esq., on behalf of the defendant, and George Naus, Esq., on behalf of the plaintiff, it is Ordered that said motion be denied. On motion of Mr. Moore, and with the consent of Mr. Naus, it is Ordered that the defendant may have a ten-day stay of execution on the judgment.

[Title of District Court and Cause.]

ORDER

The defendant having duly moved for an amendment of the findings and for a new trial, and the two motions having come on regularly for hearing, and good cause appearing, it is

Ordered:

1. The motion for a new trial is denied.
2. The motion to amend the findings is granted by striking out present paragraph VI thereof and inserting in lieu thereof the following:

“VI. That after the installation of the mechanism known as the Cottrell Precipitator, and which precipitator was in operation during the 1944 crop season, the plaintiff had the second largest crop in the history of his [46] orchard, namely, 450 tons; that said fruit for the year 1944, with the Cottrell Precipitator in operation, was not injured or damaged by and dust deposit on the fruit, on the trees, or on the ground; and the evidence does not show either the soil or the trees of said orchard are or have been injured thereby so far.”

Dated January 2, 1945.

MICHAEL J. ROCHE

United States District Judge

Approved as to form:

GEO. M. NAUS

Attorney for Plaintiffs

COURTNEY L. MOORE

Attorney for Defendant

[Endorsed]: Filed Jan. 4, 1945. [47]

[Title of District Court and Cause.]

NOTICE OF APPEAL

To the Clerk of the Above Entitled Court:

You will please take notice, and notice is hereby given, that the above named defendant, The Permanente Metals Corporation, a corporation, appeals to the United States Circuit Court of Appeals, for the Ninth Circuit, from the following part of that certain judgment rendered in said District Court of the United States in and for the Northern District of California, Southern Division, in the above entitled cause on the 12th day of December, 1944, in favor of the above named plaintiffs and against the above named defendant, to-wit: That portion of the judgment whereby and wherein it was adjudged that plaintiffs have and recover of and from the defendant the sum of \$9,903.84, [48] with costs of suit taxed in the sum of \$428.50.

Dated: January 10th, 1945.

MAX THELEN

THOMAS K. McCARTHY

COURTNEY L. MOORE

THELEN, MARRIN, JOHN-
SON & BRIDGES

Attorneys for Defendant and
Appellant

[Endorsed]: Filed Jan. 11, 1945. [49]

[Title of District Court and Cause.]

APPELLANT'S DESIGNATION OF
THE RECORD

Appellant, The Permanente Metals Corporation, having appealed from a portion of the judgment rendered in the above-entitled action, hereby designates the following portions of the record, proceedings and evidence to be contained in the record on appeal in this action:

1. The record on removal from the Superior Court of the State of California, in and for the County of Monterey.
2. The answer of defendant to the complaint.
3. The reporter's transcript (original).
4. All minutes made by the Clerk.
5. The findings of fact and conclusions of law.
6. The judgment.
7. The notice of intention to move for a new trial. [50]

8. The notice of motion to move for a new trial.
9. The order on motion for new trial.
10. The notice of appeal.
11. The statement of points on which appellant intends to rely.
12. Order for transmission of original exhibits.
13. This designation of the record.

Dated, February 8, 1945.

THELEN, MARRIN, JOHN-
SON & BRIDGES

COURTNEY L. MOORE

Attorneys for Defendant and
Appellant

(Acknowledgement of Receipt of Copy)

[Endorsed]: Filed Feb. 8, 1945. [51]

[Title of District Court and Cause.]

STATEMENT OF POINTS OF APPELLANT,
THE PERMANENTE METALS CORPORA-
TION

The points upon which appellant intends to rely on this appeal are as follows:

1. The evidence does not support that portion of the judgment awarding monetary damages in favor of plaintiffs and against defendant.

2. The Court erred in finding that dust from defendant's operations caused damage to plaintiffs' 1943 apricot crop.

hibits received or marked at the trial of this action should be inspected by the appellate court and sent to the appellate court in lieu of copies pursuant to Rule 75(i) of the Rules of Civil Procedure, it is

Ordered that the Clerk of this District Court forward said exhibits to the Clerk of the United States Circuit Court of Appeals, [55] Ninth Circuit, to be held by the latter clerk for the use of the appellate court until the decision of the appellate court on the appeal from the judgment taken by the defendant.

MICHAEL J. ROCHE

United States District Judge

By consent:

G. E. NAUS

BARDIN & HARRINGTON

Attorneys for Plaintiffs.

THELEN, MARRIN, JOHN-
SON & BRIDGES

COURTNEY L. MOORE

Attorneys for Defendant.

[Endorsed]: Filed Feb. 9, 1945. [56]

[Title of Court and Cause.]

ORDER EXTENDING TIME TO DOCKET

Good cause appearing therefor, it is hereby Ordered that the Appellants herein may have to and including March 31, 1945, to file the Record on Appeal in the United States Circuit Court of Appeals in and for the Ninth Circuit.

Dated: February 20, 1945.

MICHAEL J. ROCHE

United States District Judge.

[Endorsed]: Filed Feb. 20, 1945. [57]

District Court of the United States
Northern District of California

CERTIFICATE OF CLERK TO TRANSCRIPT
OF RECORD ON APPEAL

I, C. W. Calbreath, Clerk of the District Court of the United States, for the Northern District of California, do hereby certify that the foregoing 57 pages, numbered from 1 to 57, inclusive, contain a full, true, and correct transcript of the records and proceedings in the case of B. Pista and Marie Pista, Plaintiffs, vs. The Permanente Metals Corporation, a corporation, Defendants, No. 22983 R, as the same now remain on file and of record in my office.

I further certify that the cost of preparing and certifying the foregoing transcript of record on appeal is the sum of \$6.95 and that the said amount has been paid to me by the Attorney for the appellant herein.

In Witness Whereof, I have hereunto set my hand and affixed the seal of said District Court at San Francisco, California, this 22nd day of March A. D. 1945.

[Seal]

C. W. CALBREATH,
Clerk

By E. VAN BUREN
Deputy Clerk

In the Southern Division of the United States
District Court, in and for the Northern
District of California

No. 22983-R

B. PISTA and MARIE PISTA,

Plaintiffs,

vs.

THE PERMANENTE METALS CORPORATION. a corporation,

Defendant.

Tuesday, September 12, 1944

Before: Hon. Michael J. Roche, Judge.

Counsel Appearing:

For Plaintiffs: Messrs. Bardin and Harrington, by J. T. Harrington, Esq., and George M. Naus, Esq.

For Defendant: Courtney L. Moore, Esq., and Thomas K. McCarthy, Esq.

Mr. Naus: If the Court please, in this suit, brought by the Pistas against the Permanente Metals Corporation, the plaintiff owned an orchard. The location will be given in the evidence. It is not far from Salinas. It is within, roughly, a half mile in distance from the plant of The Permanente Corpora- [1*] tion down there that has to do with the quarrying of ore. I think it is called domite,

*Page numbering appearing at top of page of original certified Transcript.

and then processing it, and ending up with dust coming out in the atmosphere at a considerable height from the stacks, there, and being carried by the atmosphere to the orchard, and being deposited in the orchard, on the leaves, and so on. The relief asked is the damage to the crop or crops already done, and for an injunction against the continuance of the acts complained of.

The complaint sought a temporary and permanent injunction, but after a conference with the plaintiff and his personal attorney, Mr. Harrington, of Salinas, who is here, we concluded not to press the application for a temporary injunction, because our information was that this plant has engaged in some activity—not entirely clear to me, and I am not pressing now to find out—but some activity having to do with the war effort, and we concluded to wait until the final hearing, which is on at this time.

I will ask that the Clerk mark a couple of documents as to which there is no controversy here and designed primarily to give the location of things. First is a diagram to scale showing the outer boundaries of the Pista orchard, compass direction, and the distance from the Permanente plant. I have an extra copy of that, if you would like to take it along, Mr. Moore. He has only seen it this morning, and if he finds any corrections in it, they may be brought to our attention at any [2] time, your Honor.

Mr. Moore: We have no objection, subject to that understanding, your Honor.

Mr. Naus: Subject to his correction.

(The diagram was marked Plaintiff's Exhibit 1 in evidence.)

Mr. Moore: Pardon me. I do not like to interrupt you, but it might clarify things. Who drew this map?

Mr. Naus: Mr. Harrington, who drew the map?

Mr. Harrington: The Monterey County surveyors.

Mr. Naus: What data was it drawn from?

Mr. Harrington: From the photograph that you have in your hand, the original.

Mr. Moore: There are no measurements of distance on here, are there?

Mr. Naus: No, simply a scale alongside the compass direction. It would have to be scaled. The pleadings, themselves, admit, if the Court please, that the orchard was within a half mile of the plant, but I feel it would be difficult to follow some of the witnesses unless we have something graphic before us.

Next, I have in my hand, through the courtesy of counsel, Mr. Moore, one of the airplane photos of the neighborhood. Your Honor is familiar generally with the series of airplane pictures taken around the country. This is one that hits on that spot, and there is some writing on here in purple or violet ink, pre- [3] sumably put on by defense counsel, or someone connected with them, all of which we accept, because they are simply identifications of places. I will ask that the clerk mark

this next in order. And down in here at the part marked "Plant Area" is where the stacks are. The Pista orchard is not shown in full on here because the photograph does not extend far enough forward, but it shows one little point at the edge of it and gives the location, which, compared to the other diagram, will place it for you.

(The photograph was marked Plaintiff's Exhibit 2 in evidence.)

Mr. Naus: I will call a witness in a moment, but before doing that I will say that we expect the evidence to show, and we believe the fact to be, that the dust coming from these stacks was far greater in volume with relation to what would be called the 1943 crop of apricots than it was for the 1944 crop of apricots. We do not concede that no damage at all was done to the 1944 crop, but we have concluded to make no effort to prove any damage in dollars to the 1944 crop, and our proof of damages in dollars will be with respect to the 1943 crop. I will call Mr. Pista.

B. PISTA,

called as a witness by plaintiff; sworn.

The Clerk: Q. Will you state your name? [4]

A. I don't talk English.

The Court: He wants to know your name.

Direct Examination

Mr. Naus: Q. Your name is B. Pista, one of the plaintiffs, is that correct?

A. B. Pista, yes.

(Testimony of B. Pista.)

Q. Now, Mr. Pista, this apricot orchard that is near the Permanente plant, you have been the owner and in possession of that orchard and running it for a great many years, haven't you? A. Yes.

Q. How many acres do you own there, altogether? A. Sixty-six.

Q. Sixty-six or fifty-six? A. Fifty-six.

Q. Fifty-six acres. Of those fifty-six acres, some of them have been planted for some years to apricots, haven't them? Just say "Yes" or "No."

A. Yes.

Q. How many acres are in apricots?

A. 44 acres.

Q. What are the other twelve acres in?

A. Eight acres of apples.

Q. Eight acres of apples? A. Yes.

Q. That leaves four acres. What are those four acres in?

A. Well, building and creek about four acres.

Q. This map shows a creek called Gabilan Creek that goes the length of your property. The space taken up by that creek and by your building on the property takes up, altogether, about four acres, is that correct? A. Yes.

Q. Those 44 acres of apricot trees were set out or planted when? [5]

A. Planted, some of them, 1911.

Q. In the year 1911? A. Yes.

Q. You say some of them?

A. Most of them.

(Testimony of B. Pista.)

Q. When were the rest of them planted?

A. 1916.

Q. In other words, the 44 acres of apricots were planted from the year 1911 to the year 1916 completely? A. Yes.

Q. How long did it take the trees after planting or setting out to come into commercial bearing?

A. Up to six or seven years, start to come in full.

Q. I take it within six or seven years after the year 1916 those 44 acres of apricots have been in full commercial bearing? A. Yes, yes.

Q. During the years that those trees have been in full bearing, which would be apparently from 1922 or 1923, from then up to the year 1943, what is the smallest tonnage of apricots that you have gotten off of them in any one year, and what is the largest tonnage?

Mr. Moore: I think we ought to have something more definite than that, your Honor. It is preliminary, I suppose.

Mr. Naus: I do not know how it could be more definite. I am trying to find the minimum and maximum volumes of an apricot orchard over a period of twenty years.

The Court: Develop it on cross-examination.

A. The smallest crop, about 119 tons and the biggest crop 450. [6]

Mr. Naus: Q. Before 1943?

A. It was 119 least crop there.

Q. The smallest?

(Testimony of B. Pista.)

A. Yes. The biggest crop of all was 450 tons.

Mr. Moore: I didn't get that.

Mr. Naus: His answer, Mr. Moore, as I understand it, was in the period I asked about——

The Court: You are slighting the reporter. Let him read the answer.

(Answer read.)

Mr. Naus: Q. What time of the year does that apricot orchard come into blossom?

A. Well, it comes some years ten days late, some years it come early ten days.

Q. I know, but what month of the year?

A. From 25th February to about the 3rd March.

Q. During the blossom time in the year 1943 state whether or not any dust from the Permanente plant was falling on your apricot orchard?

A. Yes, all covered with white, white dust from the mine.

Mr. Naus: I will ask another witness I am going to call, Mr. Twining, to produce a box of samples, if your Honor please.

Will you mark this for identification, this cigar box contents?

(The cigar box contents were marked Plaintiff's Exhibit 3 For Identification.)

Mr. Naus: Q. Mr. Pista, do you remember sending a cigar box with leaves in it over to Mr. Twining, at Fresno, at some [7] time?

A. Yes, I did.

(Testimony of B. Pista.)

Q. Does that look like what you sent over to him? Mr. Twining has just given it to me.

A. Yes.

Q. Where were the leaves in that box gotten by you, and when? Where did you get those leaves, and when?

A. Where I got them?

Q. Yes.

A. On the ranch—I forget what day.

Q. What month? What year?

A. Oh, 1942—1943.

Mr. Moore: What year?

Mr. Naus: He said 1942-1943.

The Witness: No, 1943.

Mr. Naus: Q. When you said the ranch, what ranch did you mean, your own?

A. My ranch.

Q. As you go through there, what looks like something white or dust on those leaves——

A. I pick them from trees like that.

Q. Just a minute. You see what looks like white dust in there. Where did that dust come from?

A. It come from—I can't explain—from the Kaiser plant, but I can't explain very good.

The Court: He has some difficulty.

Mr. Naus: Q. You mean from the Permanente Corporation plant?

A. Yes.

Q. There is a quarry there as well as a plant, isn't there?

A. Yes.

Q. You mean that is where it came from, those places?

A. Yes, I see it with my eyes.

(Testimony of B. Pista.)

Q. State over how long a period dust from that place has been [8] coming over onto your apricot orchard, beginning when and running until when?

A. When they built it, right away started to come on my ranch.

Q. The judge doesn't know when they built it.

A. 1942.

Q. Do you remember about when in 1942 it started, as best you can recall?

A. They started in the springtime, I think, you know, and they finished sometime in August.

The Court: Q. They started sometime in the spring and finished in August; is that what you said?

A. Yes. Well, to the best of my memory.

Mr. Naus: Q. Tell me this: Had you harvested the crop of apricots from your orchard in the year 1942 before or after the dust started coming over?

A. I harvested before they came 1942.

Q. So you had the 1942 crop of apricots off before the dust started? A. Yes.

Q. Has the dust ever stopped coming onto your orchard from the time the plant started to operate?

A. Yes.

Q. When?

A. They started right away, really started when they started to run it. It came right away.

Q. That is not what I asked. My question is, from the time the dust started coming over onto your orchard has it ever stopped coming since?

(Testimony of B. Pista.)

A. Never stopped. All the time, you know.

Q. And through the year, through the season, how often are you out to that area—you, personally? How often do you go out there and see what is going on?

A. Well, I go two or three times [9] a week.

Q. You live where?

A. I live Watsonville.

Q. How near Salinas is this apricot orchard?

A. Well, when I pick——

Q. No, I say how near Salinas is the apricot orchard?

The Court: Q. How far?

A. Oh, 18 miles.

Mr. Naus: Q. In the year 1943 how many tons of apricots did you harvest and sell?

A. 1943——

Q. 1943. A. 27 tons.

Q. What was the condition of the fruit? Was it clean fruit? Was there dust on it, or describe it to the court.

A. All white like snow.

Q. White from what? Where did the white come from?

A. From that plant.

Q. Since you harvested the 1943 crop has the amount of dust that comes from that plant been more or has it been less?

A. No, it keeps steady the same.

Q. Is there as much dust on the 1944 crop as——

A. No, no.

Mr. Moore: I object to counsel leading the wit-

(Testimony of B. Pista.)

ness. He said "Just the same." Counsel is now asking questions of a highly leading nature, your Honor.

Mr. Naus: I have not put the question yet. May I put the question?

Mr. Moore: From the part stated it was evident it was leading. [10]

Mr. Naus: The Court says I may now finish the question, Mr. Moore.

The Court: There is a difficult situation. Both sides recognize it. He has some difficulty following the questions.

Mr. Naus: I am not seeking to lead him; I am seeking to get along with the situation as best I can.

The Court: Proceed.

Mr. Naus: I will put it this way, Mr. Pista:

Q. Was there more dust or less dust, or the same amount of dust on the apricots in 1944 as there was in 1943? A. Oh, 1943 three times more.

Q. Have you or not since your orchard has been in bearing there, sold apricots on the open market every year? A. Yes.

Q. Have you or not been familiar with the price that apricots from your orchard would bring on the open market through all those years? Just say "Yes" or "No," please.

The Court: Q. Do you understand the question?

A. No.

Mr. Naus: Then I will put it again.

(Testimony of B. Pista.)

Q. Have you kept in touch with the market where apricots are sold? Have you kept in touch with it through the years, so that each year you knew the price your apricots would bring?

A. The price depends on the crop. Sometimes get more price, some years less.

Q. I just want to know if you have been in touch with it. "Yes" or "No." Have you been in touch with it so that you knew what [11] the market was each year? A. Yes.

Q. What time of the year do the apricots get ripe so they can be picked off the trees and shipped and sold? What month of the year?

A. Some years start before ten days. This year it was later than ten days.

Q. What month of the year?

A. It would be started first of July. One year the 27th of June. This year started the 9th of July, you know, some fifteen days difference.

Q. How long does the picking of the fruit continue? How long does it take to pick the whole crop each year? A. About six weeks.

Q. In the year 1943, in the months of July and August, 1943, when the crop was being picked, what would be the price of apricots from your orchard in the market if there had been no dust?

Mr. Moore: Just a moment. I think that question is argumentative and assuming a lot of facts, that there was any change in the price of apricots due to dust.

(Testimony of B. Pista.)

Mr. Naus: I have not assumed that one way or the other. I have tried to find what the state of the market was.

The Court: I know what you are trying to find, but if the reporter reads that question I am quite sure you will withdraw it. Read the question.

Mr. Naus: Will your Honor indicate to me why you wish me to? [12]

The Court: Read the question.

(Question read.)

The Court: I do not see how it is possible to answer that.

Mr. Naus: Pardon me?

The Court: There was dust.

Mr. Naus: I know, but then there was dust——

The Court: If there wasn't dust, could he determine?

Mr. Naus: Here is a man who is familiar with the market. He knows what it is.

The Court: You will have to develop the facts, whatever they are.

Mr. Naus: My question is only to find out what the market was for apricots affected by dust.

The Court: Read that question again. It may be.

(Question re-read.)

If there had been no dust—I can't follow it.

Mr. Naus: If there had been no dust on the apricots. We want to show what the market was for undamaged apricots.

(Testimony of B. Pista.)

Mr. Moore: I think there is a way to establish that. They go in grades and all sorts of things. There are State reports and various other ways of showing what the prices of apricots were, but to ask him what he considered the price——

The Court: My task is simpler. If he can answer it, he may answer it. I am attempting to follow it. That was my point. [13]

Mr. Naus: I will reframe the question, then, to clear up the situation.

Q. At what price or prices were fresh apricots being bought and sold in the market in the months of July and August, 1943?

Mr. Moore: Just a minute, please. You say in the market. Do you mean at Salinas, or where? I think the question is indefinite.

Mr. Naus: Is that an objection?

Mr. Moore: It is an objection. I object to the question as being indefinite. Fix the market? Are you referring to San Francisco, Los Angeles, or where?

The Court: Read the question.

(Question read.)

The Court: If he knows he may answer.

A. Well, they sold, you know, San Francisco—— they sold——

The Court: You see, your question is being answered now, Mr. Moore. Go on.

The Witness: They sold in San Francisco \$2

(Testimony of B. Pista.)

and \$1.90 a box. Los Angeles sold some 10, some 12½, some 13, and some dumping—no good because of the dust.

Mr. Naus: Will you read that answer, Mr. Reporter?

(Answer read.)

Mr. Naus: Q. \$2 and \$1.90 a box in San Francisco?

A. Yes.

Q. I would like to follow that up. In San Francisco are apricots bought and sold by the box or by the pound? A. By the box. [14]

Q. That price of \$2 or \$1.90 is by the box, is that correct? A. Yes.

Q. In Los Angeles are apricots bought or sold by the box or by the pound?

A. By the pound.

Q. And when you gave the figure of 10, 11 or 12, or whatever it was, you meant dollars, pennies, or what? You mean cents per pound?

A. Yes.

The Court: He has some difficulty in following you.

Mr. Naus: Yes, I understand. I am attempting to avoid leading him. I think this is a matter about which there can be little dispute.

Q. Mr. Pista, when you say 10, 11 or 12 at Los Angeles, do you mean in Los Angeles apricots are bought or sold by the pound? A. Yes.

(Testimony of B. Pista.)

Q. And you mean 10, 11, or 12 cents a pound, don't you? A. Yes.

Q. And when you say \$2 or \$1.90 in San Francisco, you mean by the box, don't you?

A. In San Francisco, by the box.

Q. How many pounds of apricots are there in a box?

A. Oh, if you fill them nice, you know, 27 pounds.

Q. 27 pounds in a box? A. Yes.

Q. What are the kinds or items of expense you have to go to to get apricots off of a tree and get them either into the San Francisco or the Los Angeles market? There is picking and packing, isn't that so? Tell the judge what there is. There [15] is picking expense, is there? A. Yes.

The Court: You will have to lead him somewhat. Go step by step.

Mr. Naus: I will lead on this, because there won't be any dispute about it.

Mr. Moore: May I make a suggestion? We took Mr. Pistas' deposition and his son is in court. He is familiar with the figures. He kept the books.

Mr. Naus: If the Court please, I will lead him through the obvious and I will discontinue at any time your Honor directs me.

Q. Mr. Pista, how much a ton in 1943 would it cost to pick the apricots off the trees?

A. It cost me \$25.

Q. \$25 a ton? A. Yes.

Q. For picking? A. Yes.

(Testimony of B. Pista.)

Q. And then after you picked them you had to put them in a box to get them to the market. How much do the boxes cost you?

A. Cost around \$5, you know, sir.

Q. \$5 a box, \$5 a ton, or \$5 what?

A. \$5 a ton.

Q. Then you have to do sorting. You have to buy the boxes. A. Oh, yes, the boxes buy.

Q. That \$5 a ton is for what?

A. For sorting, cleaning them out.

Q. How much a ton does it get you to get the boxes to put them in?

A. It costs me about—the price around 18—oh, let me [16] see, 17 cents a box.

Q. How much?

A. Maybe cost thirteen and a half to fourteen dollars for boxes for a round ton.

Q. Thirteen and a half to fourteen dollars a ton is what the boxes cost, themselves? A. Yes.

Q. And how much a ton does it cost to ship them to the market? A. It costs \$11.

Q. \$11 a ton. In the San Francisco and in the Los Angeles market you have to pay a commission man, don't you, for making the sale? A. Yes.

Q. How much do you pay him? How much does he cost? A. Cost \$15.

Q. Is it \$15 or 15 per cent?

A. 15 per cent, that is right.

Q. 15 per cent he charges commission for selling, is that right? A. Yes.

(Testimony of B. Pista.)

Q. Mr. Pista, when do the trees bud? When do the buds come on the trees?

A. Oh, they start in around 20th of February.

Q. Is that the bud or the blossom?

A. No, just open, you know—some of them open, you know.

The Court: Can you distinguish between bud and blossom?

Mr. Naus: I think there is a distinction, but I had difficulty pursuing it with him, so I will discontinue it. I *definitely* there is a distinction, yes.

Q. When the trees bud or blossom can you, from your experience, looking them over, see whether there is going to be a light [17] crop or a heavy crop, Mr. Pista? A. Yes.

Q. In your opinion——

Mr. Moore: I do not like to object——

Mr. Naus: I have only started to ask the question. You can object when I have asked it.

Mr. Moore: Perhaps I can bring it out on cross-examination, but in your previous question you referred to bud or blossom. I understand they are entirely different phenomena of nature. Budding and blossoming are not the same.

Mr. Naus: His Honor asked me the same question and I told him I thought there was a distinction between them, but I would have difficulty pursuing it with this witness. I will pursue it with other witnesses. That there is a distinction there is no question.

(Testimony of B. Pista.)

Q. If no dust had come over from that Permanente plant in the year 1943, Mr. Pista, what, from your experience and from what you saw about the trees that year, would have been the number of tons you could have harvested from the trees?

Mr. Moore: I am going to object to that, your Honor. That question is highly objectionable, argumentative, and assuming facts that are not in evidence. How he could tell as an expert whether the cement dust caused a short crop or not, I do not know. He is not qualified as an expert in any way, shape, or form.

I might make a short statement, your Honor, in connection [18] with that, so that your Honor can understand our position. The apricot crop in California in 1943 throughout the State was about 20 to 25 per cent of normal caused, we expect to prove, by rains which cause the fungus or rot to kill the apricots. It rained, we are prepared to prove, in Monterey County, and throughout Monterey County there were short crops. To ask this man whether he had a short crop because of that cement dust I take it, your Honor, is going far beyond his capacity. He cannot testify. He is not qualified in any way to prove what was the cause of a short crop in 1943.

Mr. Naus: That is not the question that was put to him.

Mr. Moore: I think it is.

Mr. Naus: No, that is not the question that was put to him.

(Testimony of B. Pista.)

Also, which the proof will show, the orchard still has dust falling on it, and he had probably the largest crop he has ever had in the history of his orchard in 1944. In other words, our position is, due to inclement weather, this man had a short crop in 1943, and wants Permanente to pay for it. Now, to ask him to testify that his short crop was caused by cement dust, I submit, your Honor, he is not qualified or has not been qualified to testify on any such subject as that.

Mr. Naus: That is not the question, if the Court please, and following up that other slur that he wants Permanente to pay for a short crop, that is not true. He wants Permanente to pay only for the damage done. They contend, apparently, [19] that the dust from those stacks benefitted the crop. I do not know the exact percentage of the yield of dust, but one of the counsel for the plaintiff, in a conversation with Mr. Harrington, said that since the 1943 crop they have reduced the volume of dust about 97 per cent. We know they have reduced it. We can't talk in terms of percentage, for we cannot walk in their plant, a war plant, and analyze those things. Counsel is reading something in that question that is not in the question. I ask to have the question read so that he can see the simple form in which it is stated, and ask your Honor for a ruling.

(Question read.)

The Court: I will allow the question. It goes to the weight of the answer.

(Testimony of B. Pista.)

Mr. Naus: Will you answer? Does your Honor want me to restate it, or does your Honor want it repeated?

The Court: Reframe the question.

Mr. Naus: Mr. Pista, in 1943 you testified that you were down at the orchard two or three times a week, that you saw the orchard, you saw the condition; now, if no dust had come on your orchard, what do you estimate is the number of tons of apricots you should have harvested in 1943?

Mr. Moore: So the record will show it, your Honor has already ruled, the question has been re-stated, and I will object to it as incompetent, irrelevant, and immaterial, assuming facts not in evidence. This man is not qualified to tes- [20] tify along that line.

The Court: The objection is overruled.

Mr. Moore: Note an exception.

Mr. Naus: Q. Can you answer?

A. If there was no dust from cement my figure would be from 200 to 250 tons.

Q. From 200 to 250 tons? A. Yes.

Q. In 1943, when the dust was there, were the 27 tons that you harvested and shipped all that you were able to harvest and ship?

A. That is all I had.

Mr. Naus: I might say, if the Court please, that from the books kept directly by young Mr. Pista, who can talk more freely, I will endeavor to show the prices at which it was actually sold rather than pursue it by this witness.

(Testimony of B. Pista.)

Q. By the way, in your operation of that orchard, in your harvesting and shipping, do you try to sell your apricots as dried apricots or as fresh fruit?

A. I sell for best market. If they dry better I sell for dry. If it is better in the fresh market, I ship them in the market.

The Court: There are some other matters I want to take up. It is time for adjournment. We will adjourn until two o'clock.

(A recess was thereupon taken until 2:00 o'clock p. m.) [21]

Afternoon Session.

September 12, 1944, 2:00 P.M.

The Court: Proceed.

B. PISTA,

recalled:

Cross-Examination

Mr. Moore: Q. Mr. Pista, referring to these leaves produced here, can you tell us the date on which you gathered those leaves?

A. No, I can't tell you, but I picked them green.

Q. 1943, was it? A. Yes.

Q. Can you tell us what month in 1943?

A. No, I can't.

Q. Was it in the spring, or the summer, or the fall?

(Testimony of B. Pista.)

A. Well, you know I picked them—they was in very bad shape. That is what I sent to the man in Fresno.

Q. Did you pick them on the same day, or over a period? A. All on the same day.

Q. When did you send them down to Mr. Twining? A. I don't know.

Q. Did you write him a letter?

A. I gave my son—he sent.

Q. Have you any memorandum or note from which we can fix the time that you gathered these leaves? A. I don't know.

Mr. Naus: If it will help any, Doctor Twining tells me, according to my note, he received them on December 10, 1942.

Mr. Moore: If that is correct, these were gathered in 1942 rather than in 1943, is that correct?

Mr. Naus: So I understand. I did not ask Dr. Twining whether they all came at one time or not. That is my recollection. [22] If you wish to suspend, I will put Dr. Twining on just for the two or three questions, as to what date he received them. If I were able to tell you I would.

Mr. Moore: Is he here?

Mr. Naus: He is here.

Mr. Moore: I would like to have the date fixed, if I could.

Mr. Naus: Will you come forward, Dr. Twining? I will just ask him here and later he can be asked under oath with respect to the matter of dates merely. Doctor Twining, will you tell the Judge

(Testimony of B. Pista.)

and Mr. Moore as best you can the dates you received the sample or samples of the leaves and the like from Mr. Pista?

Dr. Twining: On a trip to Salinas, in talking to Mr. Pista, he said he had collected these leaves in the late fall of 1943.

Mr. Naus: 1943?

Dr. Twining: Yes, and they were sent to me along about the 1st of April this year. That is, this particular box.

Mr. Naus: Had you received some earlier?

Dr. Twining: I received some in December the year before.

Mr. Naus: 1942?

Dr. Twining: Yes.

Mr. Naus: Is there anything else?

Mr. Moore: Are they here, too?

Dr. Twining: No. In fact, I did not know they were connected with any case.

Mr. Naus: They were sent to the laboratory in Fresno? [23]

Dr. Twining: Yes.

Mr. Naus: Was that the date, December 10, 1942, that you gave me yesterday, the first lot?

Dr. Twining: The first lot.

Mr. Moore: But these particular leaves were sent to you in April of this year?

Dr. Twining: Yes.

Mr. Naus: I had confused what he got in December, 1942 with this cigar box.

(Testimony of B. Pista.)

The Court: Does that clear it up?

Mr. Moore: Yes.

Mr. Naus: Dr. Twining later took personally some samples out of the orchard, himself.

Mr. Moore: Q. Mr. Pista, after hearing Mr. Twining, does that refresh your memory? Did you gather these leaves in the fall of 1943?

A. Yes, the fall of 1943, you know.

Q. That was after the harvest? A. Yes.

Q. After the harvest of 1943?

A. When I finished fruit, yes.

Q. Let me ask you, what trees did those particular leaves come from?

A. They came all through; some in the field, around the house, you know.

Q. Did you mark any particular leaf as to what particular portion of the orchard it came from?

A. No, I just picked these white leaves.

Q. You went out, looked around, and picked out leaves that had [24] white on them, is that right?

A. Yes.

Q. Let me ask you, are these all leaves from apricot trees?

A. Some apricot trees, some fig, some apples, you know, just the same. Every tree is the same as apricots.

Q. Aren't these lying on top fig leaves?

A. This is apricots (indicating), this is figs, see? This one is figs.

Q. And the fig trees are by the house? How many fig trees are there?

(Testimony of B. Pista.)

A. Just a couple of trees.

Q. Mr. Pista, you said on your direct examination that your crop had varied in the past from 119 tons to 450 tons. Can you tell us what years those variations took place in? Take a period for five years back of 1943. Can you tell us what your crops were?

A. Well, I don't know. My son keep the books. I don't know. I come in court with this, you know. He's got it in the books, my son.

Q. When you testified here, did you testify from books, or did you know what your crop was in previous years?

A. He told me we got a smaller crop in 1942 and the biggest crop, 450.

Q. Isn't it a fact that in 1937 you had a crop of about 400 tons? Isn't that correct?

A. Yes, about 400, maybe more.

The Court: What year was that?

Mr. Moore: 1937.

Q. 1938 you had 479 tons, didn't you?

A. Well, my son gave me—you got it there.

Q. Do you recollect? Are those figures correct?

A. Yes, by the [25] books.

Q. 1939 you had 138 tons, is that correct?

A. Yes.

Q. 1940 you had 118, or practically 119 tons?

A. Yes.

Q. 1941 you had 248 tons, is that correct?

A. Yes.

(Testimony of B. Pista.)

Q. 1942 you had 214 tons? A. Yes.

Q. Now, can you tell us what the reason was that in 1940 you only had 119 tons where two years before you had practically 480 tons? What caused that short crop that year?

A. Well, you know sometime trees in one year aren't good, you know. That is the way we find it.

Q. You remember you had a short crop in 1940, don't you?

A. Sure, my son told me from book.

Q. I know but don't you remember the orchard?

A. Well, I remember what they told me.

Q. Don't you remember of your own recollection that in 1940 you had a short crop there? Don't you remember that?

A. I remember—you know, you remember when you are in Salinas my son show you a book and show me at the same time.

Mr. Moore: I do not like to repeat, your Honor, but I would like to ask this:

Q. Don't you know of your own knowledge that you had a short crop in 1940, aside from what your son told you?

A. Well, best of my—maybe was rain or something.

Q. What was that answer?

A. Maybe it was rain or something. Can't get every year a big crop. [26]

Q. Going back to 1940, do you remember whether there was a rain that year?

(Testimony of B. Pista.)

A. I don't remember.

Q. You don't remember? A. No.

Q. Coming to 1943, was there a rain that year?

A. It was some rain, yes.

Q. When did that rain take place with respect to the blossoming of the fruit?

A. Well, had rain but not so heavy, you know.

Q. Did it rain while the fruit was in blossom?

A. Yes, some.

Q. When did the fruit in 1943 start to blossom? What date?

A. Well, I guess around the 1st of February.

Q. The first of February?

A. Maybe, you know. I don't know.

Q. You spray down there, don't you?

A. Yes.

Q. In 1943 did you spray your orchard?

A. Yes.

Q. In the spring? A. Yes.

Q. Was that at the time it was in blossom, or before, or after it was in blossom?

A. Well, just started to go pink, you know—one blossom here, one blossom there, like that.

Q. Just when the blossoming started you sprayed?

A. Yes.

Q. Did you keep a memorandum of the date on which you sprayed? Have you any memorandum to show what date you sprayed that orchard?

A. I don't know. Maybe it is in the book.

(Testimony of B. Pista.)

Mr. Moore: Is that information available, Mr. Naus?

Mr. Naus: Mr. Moore, I told you from the very beginning our books were available to you. You have mentioned them once. I told you you could have an accountant in. You know that Mr. [27] Pista is here and, so far as I know, he has brought his books with him. They are available.

Mr. Moore: What I am trying to find out, if I can, is the date the spraying took place. Is there a record of the date that you sprayed that orchard?

Mr. Naus: I will call young Mr. Pista and you can get the date directly, if you want.

Mr. Moore: I would like to get the date, yes.

Mr. Naus: Mr. Pista, if you can give any dates to Mr. Moore that he desires, give them.

Mr. Pista: I can give the approximate date.

Mr. Moore: I can't get it from this witness.

Mr. Naus: I do not think you could get it from your own memory if you were down there unless you had a record of it.

Mr. Pista: Apparently the bookkeepers at that time did not itemize it.

Mr. Moore: May I make a request, your Honor? There has been a deposition returned here. Might I get an order of court opening that deposition?

The Court: Yes.

Mr. Moore: I will pass that subject. I would like to get it in later, your Honor, the exact date of this spraying.

(Testimony of B. Pista.)

Mr. Naus: I might say, if the Court please, in the course of a deposition or depositions taken at Salinas last May, at which Mr. Moore and I and Mr. Harrington were present, he re- [28] quested that that information be compiled if possible. I have not seen the original of the deposition, but I understand young Mr. Pista attempted to compile the spraying dates for the years 1941, 1942, 1943, and 1944. and a memorandum was understood to have been attached to the deposition giving that as best it could be compiled from the books. That is all I know about it.

Mr. Moore: That is correct. The depositions were taken in May but were not returned until last Saturday with this data.

Mr. Naus: So far as Mr. Pista telling from memory, we know that is impossible. So far as the records are available, they are open to counsel and always have been.

Mr. Moore: I consider the date of the spraying and the date of the blossoming highly important, and that is the reason I want the witness to fix it if possible.

Q. Mr. Pista, if I understand you correctly, you sprayed in 1943 just as the blossoming started, is that correct? A. Yes.

Q. How long did that blossoming continue, about two weeks? A. Oh, two or three weeks.

Q. Do you remember whether in 1943 it rained during that period of time?

(Testimony of B. Pista.)

A. Not much worse rain.

Q. Well, did it rain?

A. It rained one day and stopped four or five.

Q. Don't you know as a fact throughout the State of California there was a very short crop in 1943?

Mr. Naus: One moment, if the Court please. Objected to [29] as immaterial as to what happened in the whole of California. We are only interested in a small apricot locality.

Mr. Moore: I think the climatic conditions were the same all over the State.

Mr. Naus: If the Court please, does Mr. Moore mean to suggest that the rain conditions on the Mojave Desert were the same as in Trinity County? We are concerned with the particular locality in Monterey County.

Mr. Moore: I am asking him if there was not a short crop in the apricot crop—nothing else—in the State of California during the year 1943.

The Court: He may answer if he knows.

Mr. Moore: Q. Do you know?

A. It was short but my ranch never failed, only in that year. It was all covered with white dust when there was a big blossom.

Q. Isn't it a fact, and you know as a man engaged in that business, that in 1943 there was a short crop of apricots throughout the State?

A. I hear of it, yes.

Q. Somewhere in the neighborhood of about 20

(Testimony of B. Pista.)

percent of normal, is that correct? Is that what you understand?

A. I don't know, you know. I don't know, really, you know.

Q. You know the Wilmouth orchard that is in that neighborhood there near Salinas?

A. I never asked them.

Q. Don't you know that he had a very, very short crop on that ranch? A. I don't know.

Q. You know the Anderson ranch?

A. I know Anderson.

Q. Don't you know they had a crop that was about 10 percent of normal in 1943?

A. I never asked them.

Q. Do you know the Hill ranch, orchard?

A. Yes.

Q. Do you know that that had a crop of about 10 percent of normal?

A. I don't know. I didn't ask them.

Q. You know the California orchard; they have two orchards in King City?

A. I hear of them. I don't know.

Q. Do you know whether or not they had a short crop that year? A. I don't know.

Q. Do you know Mr. Eiper, who is the local secretary down there, and who has a ranch of about 20 acres in there?

Mr. Moore: No, up the other way, I believe.

Mr. Naus: Where?

(Testimony of B. Pista.)

Mr. Moore: Up near Rosamond.

Q. Do you know he had about three tons of cots in 1943?

A. I never hear it from that date.

Q. Do you know of anybody in your neighborhood that had a 100 percent normal crop in 1943?

The Court: Q. Do you understand that question? A. A crop in 1943?

Mr. Moore: Q. Yes.

A. Oh, yes, I hear there is around 25 percent. I hear that the people talk.

Q. Do you know anybody in that neighborhood who had a normal crop of the same size that they had the year before? Do you [31] know any apricot grower in that neighborhood who had what would be termed a full crop? Do you know of a solitary one?

The Court: Q. Do you understand that?

A. What you say?

The Court: He has some difficulty understanding.

Mr. Moore: Q. Do you know of a solitary—

Mr. Naus: I doubt if he knows what "solitary" means.

Mr. Moore: Q. Do you know anybody in that neighborhood who had a full crop in 1943?

A. No, I don't think so. Nobody, no.

Q. They all, so far as you know, had short crops, is that correct?

A. Well, some ranches run—next to mine, he had, I guess, 60 percent.

(Testimony of B. Pista.)

Q. But they all had short crops that year, didn't they? A. Well, I heard, yes.

Q. Some of those orchards that had short crops weren't anywhere near this dust, is that correct?

A. What?

Q. I say some of these orchards that had short crops were not near this plant at all, or had no dust on them, is that correct? A. Yes.

Q. You had a crop this year; what kind of a crop did you have this year?

A. I had a fair crop.

Q. How many tons? A. 450 tons.

Q. 450 tons this year? A. Yes.

Q. That is one of the biggest crops you had ever taken off of that ranch, isn't that so?

A. Yes. I figure this year the biggest. [32]

Q. As a matter of fact, the yield there was so great that you had to thin the trees out, didn't you?

A. Yes.

Q. You had to go out and take the young apricots off of them and thin them out, they had such a heavy bearing, isn't that correct?

A. Yes.

Q. And you still got 450 tons this year?

A. Yes.

Q. When did you acquire this ranch, Mr. Pista?

The Court: Q. When did you buy this ranch?

A. 1910.

Mr. Moore: Q And what was on it at that time?

(Testimony of B. Pista.)

A. It was some old trees, you know, not much. I planted more.

Q. How many old trees were there? How many acres of the total amount?

A. About around six acres—five or six acres.

Q. Are those trees still there?

A. Yes, some.

Q. Some have died, have they? A. Yes.

Q. Have you planted new trees?

A. Yes, the old trees, Delicious apples.

Q. Apples? A. Yes.

Q. You planted the balance of the orchard, you say, in 1911? A. In 1911.

Q. And 1916? A. Yes.

Q. Have you had any trees die there in those years?

Mr. Naus: What years?

Mr. Moore: Q. From 1911 to date have you had trees die?

A. What you mean? Old trees?

Q. Any trees. A. Yes, she dies. [33]

Q. What do they die from, do you know?

A. They die—pretty old trees.

Q. Don't a good many of them die from oak root fungus?

A. Yes, some of them maybe die from dust.

Q. In 1943 where did you sell your crop? To whom did you sell it?

A. We sent it on commission.

Mr. Moore: I probably can get this better from young Mr. Pista, don't you think so?

(Testimony of B. Pista.)

Mr. Naus: Mr. Moore, it would be impossible to get it from this gentleman on the stand with any satisfaction. That has previously been compiled for you. It is in the nature of a report. The books are available, and young Mr. Pista is the best one to talk about it. The copy we have given you gives the names, the quantity, the amounts, and all that, and you can use it and refer to it directly if you wish, or you can call young Mr. Pista up now and ask him for any books you want to see, or ask him any questions you want. You will save time in that way, rather than trying to have Mr. Pista give you that detail.

Mr. Moore: Q. Mr. Pista, is the dust still settling out there on your orchard?

A. Yes. You got it right here.

Q. What do you mean "right here"?

A. I bring some leaves.

Mr. Naus: I think that sample is on top of the coat rack, there.

The Witness: Could I please go get it? [34]

Mr. Moore: Are these what you refer to?

Mr. Naus: I think so.

Mr. Moore: Q. Are these what you refer to?

A. Let me show you. This was the last year (indicating)—it was 1943, through this year. You see 1944 hasn't got it so much. You see it is here.

Q. This is 1944?

A. 1943—this is 1944. Not much like 1943—three times much worse.

(Testimony of B. Pista.)

Q. What are those?

A. This is apricots, figs—all kinds.

Q. And these that are in this bag are all 1944?

A. Sunday morning I picked it.

Q. This last Sunday?

A. Yes, last Sunday.

Q. Now, you testified on direct examination that the dust never stopped from the time they started the plant, is that correct?

A. No, a long time ago, but 1944—it wasn't like 1944.

Q. You say the dust caused you to have a short crop in 1943, is that your statement?

A. It was my statement that it all killed my ranch, 1943.

Q. On what basis do you make that statement?

The Court: The basis?

Mr. Moore: Q. Why do you say that?

The Court: Tell him.

A. I say 1943 was the cloud of dust, white stuff, all white.

Mr. Moore: Q. Was that true in 1944?

A. 1944 was never like 1943. [35]

Q. In other words, the dust in 1944 did not affect your crop at all?

A. He don't affect—he buy my apricots, he don't kick, they no pay attention to that.

The Court: Make your question as simple as you can.

Mr. Moore: Q. Did the dust hurt your crop in 1944? A. No.

(Testimony of B. Pista.)

Q. You say it did in 1943? A. Yes.

Q. Did the rain have anything to do with your crop in 1943?

Mr. Naus: What do you mean, does the rain have something to do with the crop?

Mr. Moore: The yield, the short crop.

The Witness: I don't know the yield. It might.

Mr. Moore: Q. You say the rain might have had something to do with the short crop?

A. I can't tell you that.

Q. You can't tell that?

A. You know, but I know my ranch give every year since fair crop, average.

Q. You did not have a very good crop in 1940, did you? You only had 118 tons.

A. I don't know.

Q. Do you know what caused that on this crop?

A. I can't tell you, you know.

Q. How long have you been in the orchard business, Mr. Pista? A. 44 years.

Q. How long, 45? Do you mean to say that you can't tell us why you had a short crop in 1940?

A. I can't tell you truthfully. This year—excuse me if I talk too much—I got my ranch at Watsonville. I got a half crop of apples. [36]

Q. Did rain have anything to do with your short crop in 1943?

A. I don't know. It is in the book, you know. I don't write, you know.

Q. Were you down there at the ranch in 1943 when they were blossoming?

(Testimony of B. Pista.)

A. Yes, when I spray, it was not raining at that time. You can't spray if it is raining.

Q. How long did you stay down there when you sprayed? A. Every day.

Q. While the blossoms were out did it rain?

A. Well, I forget it, whether it rained at that time or not, you know.

Mr. Moore: That is all.

Mr. Naus: No further questions. Call Mr. Lewis.

WILLIAM LEWIS,

called as a witness by plaintiff; sworn.

The Clerk: Q. Your name?

A. William Lewis.

Q. And what is your address?

A. 1370, Salinas, California.

Q. Your address is Salinas? A. Yes.

Direct Examination

Mr. Naus: Q. You live there in Salinas?

A. Yes.

Q. What occupation do you follow?

A. I am Deputy Agriculture Commissioner.

Q. For Monterey County?

A. Monterey County.

Q. For how long have you been in that office?

A. I came to Monterey County in 1932, as an inspector; in 1933 I was gone for [37] about six months with the Bureau of Biological Survey. I

(Testimony of William Lewis.)

came back in 1935 and I was in Santa Cruz County for two months and a half. When I came back to Monterey County I came back as Supervising Inspector, and around 1939 I was appointed Deputy Commissioner, after passing the examinations.

Q. In the time that you spent from 1932 on in the places and in the offices that you have mentioned, state in a general way to his Honor specifically what it is that you have done with respect to orchards and the like, the nature of your work specifically?

A. My work specifically is enforcing officer of the Agricultural Code on plant life. The work is composed of rodent control, predatory animal control, orchard and field inspection, apiary inspection, fruit and vegetable standardization, plant quarantine, and seed inspection.

Q. In the course of that work from 1932 to date have you or not personally made inspections in and about orchards in Monterey County?

A. I have.

Q. And you have inspected orchards, fruit orchards I have in mind, with what purpose or what object?

A. The object was pest control, advice on the control of pests, and the Agriculture Commissioner is required to file an annual report with the Director of Agriculture of the State of California, regarding those diseases and regarding the problems in his county. He is also required to file, when re-

(Testimony of William Lewis.)

quested, an estimate of crops with the State and Federal statisticians regarding the [38] condition of the crops in his county.

Q. The State and Federal crop estimates, then, as I take it, were based, so far as Monterey County was concerned, on the field data that you compiled and reported, is that correct?

A. That is correct.

Q. I will show you Plaintiff's Exhibit No. 2, Mr. Lewis. It is an air view down around the Permanente Plant. It simply shows as much as that air view took. It does not show the whole region. You can recognize and identify that area, I take it?

The Court: Q. Did you see this picture before?

A. I am a little puzzled on this.

Mr. Naus: Do you wish to step up a moment, Mr. Moore?

The Witness: Wait a minute. I was looking at it wrong. Here we are. Now we have it.

Mr. Naus: Q. Here is the road coming along. Here is where the plant is with these stacks. Here is a quarry, here is a quarry, here is the Anderson orchard over here, and there is a piece of the Pista orchard, and then there are other orchards over here. With that in mind you identify the locality, do you, that air view of it?

A. Yes, I have got it now.

Q. In the year 1942, and in the year 1943, did you personally inspect the orchards that appear on that air photograph? A. I did.

(Testimony of William Lewis.)

Q. In the years 1942 and 1943 did you personally inspect other orchards in that neighborhood or vicinity, but outside the area [39] of the photograph?

A. Practically all the orchards in Monterey County.

Q. Practically all of the orchards in Monterey County? That would necessarily include, would it not, all apricot orchards?

A. Apricot orchards, apples, and cherries.

Q. Did you inspect the orchards on these occasions in question for the presence of plant disease and the like? A. Yes, I did.

Q. Did you or not in those inspections of orchards in the years 1942 and 1943 inspect them with respect to the presence of bugs and later the presence of fruit that has been set and the crop that ought to be produced?

A. In order to make my estimates for the State and Federal I would have——

Q. You did inspect for those purposes and at those times, didn't you? A. Yes.

Q. Take the Pista orchard, the one in this lawsuit here. State what you found on inspection in the fall of 1942, for example, when you inspected that orchard?

Mr. Moore: Pardon me, Mr. Naus, can we get the date located more definitely?

Mr. Naus: I will cover that, Mr. Moore. In this lawsuit, as in any other, we can't get every fact in one question. I will touch on that.

(Testimony of William Lewis.)

Mr. Moore: I think that is preliminary, your Honor.

Mr. Naus: Nothing will be concealed.

Mr. Moore: I did not say anything was being concealed, but [40] I think we are entitled to it.

Mr. Naus: Do you want that all in one question and answer? I assure you it will be covered. Did you want it all in one question and answer, or shall I proceed, your Honor?

The Court: Proceed.

Mr. Naus: May I have the question read?

(Question read.)

A. In the fall of 1942?

Mr. Naus: Yes.

A. That was the latter part of September.

Q. Yes. A. I can't give the date exact.

Q. That is as near as you can come to it. In the latter part of September, 1942? A. Yes.

Q. Proceed then and state what your inspection disclosed with respect to disease, with respect to bugs, or anything else that you might have observed.

A. I was checking for scale, spider, shot hole fungus and brown rot, also a condition of fruit buds.

Q. That is what you were checking to find out?

A. Yes.

Q. Having made that check what did you observe or find?

(Testimony of William Lewis.)

A. It would be unnecessary for Mr. Pista to use an oil spray for any scales. In the center of the orchard, part of the fruit spores was injured from the brown rot of the apricot fruit. The remainder of the fruit spores carried a fairly good set of fruit buds, and the leaf buds showed plenty of strength, in other words healthy. [41]

Q. Will you describe to his Honor what is meant by your expression, a fairly good set of fruit buds? What does that mean?

A. That on each cluster or spore there would be sufficient buds if they had kept on developing to give good bloom the next spring.

Q. By the way—I will continue with this orchard inspection in a moment—but will you tell me at this point whether at any time you ever observed this white dust that falls on the orchard from the Permanente plant, whether you observed it in the orchard?

A. Yes, I did.

Q. Beginning when, about? I will reframe that question. On the occasion of this visit in September, 1942, did you observe some?

A. I am not sure of the date, whether it was that date or a date before that, but I picked it up on the Anderson orchard first and then followed it over to the Permanente. I didn't know what it was at first.

Q. When you speak of the Anderson area, you are speaking of the place that appears on the photo-

(Testimony of William Lewis.)

graph, Plaintiff's Exhibit 2, under the legend or name "Anderson orchard," is that correct?

A. Yes, that is the Anderson orchard.

Q. That is slightly nearer the Permanente plant than the Pista orchard, isn't it? A. It is.

Q. But in a slightly different direction, as you recall? A. Yes, they are slightly different.

Q. Taking the Anderson orchard and the Pista orchard, and from first observations merely, had you noticed whether or not there [42] was any difference between those two orchards with respect to the volume or amount of this light Permanente dust that settled on them?

A. Apparently more dust settles in around the Pista house than settles on the Anderson, and that area in there, taking an angle across through the orchard, and the rest of it, the further area, comes pretty near the same.

Q. After your observation of these trees in the fall or September of 1942, did you subsequently, in the spring of 1943, inspect and observe the Pista orchard along with many other orchards in Monterey County A. I did.

Q. About when?

A. In the latter part of February.

Q. February, 1943? A. 1943.

Q. Had the stage of blossoming been reached yet at that time?

A. It hadn't been reached to the point of spraying, that is, it hadn't quite got to the pink bud stage.

(Testimony of William Lewis.)

Q. It hadn't quite got to the pink bud stage?

A. Yes.

Q. And at that time, in February, 1943, was the white Permanente dust settling on that orchard?

A. Yes, there was white dust there.

Q. Was it easily visible to the naked eye?

A. It was on the trees, on the buildings, and on the ground.

Q. You did not need a microscope to see it, did you?

A. No.

Q. Could you state to the judge how easily or how readily it could be seen or the extent of it, as one would look at it on the ground. Describe it to him.

A. When I first saw the dust——

Mr. Moore: Pardon me just a moment. Is he referring now to this visit in February?

Mr. Naus: In February, 1943, yes.

Mr. Moore: I just wanted to be sure what he was talking about.

The Court: He does not know whether it was the visit before that or the visit after that he first noticed it.

Mr. Naus: His answer was he fixed it in the fall of 1942. I then asked him whether he observed it in 1943. He now fixes it: he did see it then, so I am asking him to describe to his Honor what he saw then, as well as he can describe it.

The Witness: There was a white coating on the ground, a light white coating on the ground, and there was also a white coating on the trees.

(Testimony of William Lewis.)

Mr. Naus: Q. Did you on the occasion in February, 1943, that you speak of—I understood you described it they were not quite to—what was it, the pink bud stage? A. Yes.

Q. Did you make any observation, inspection or estimate with respect to the probable extent of blossoms, fruit and the like to expect from those trees? A. Do you mean blossom or fruit?

Q. Either, or both.

A. I will have to use the term blossom.

Q. All right, then, use the term blossom.

A. It looked like they would have a fair blossom—in other words, the trees when they would bloom out would be white.

Q. When you use the phrase “fair blossom,” will you describe to his Honor what meaning or significance that term carries with [44] respect to what might be called the expectancy of fruit?

A. Using the word “expectancy,” that there would be enough bloom on there that if a certain percentage of them set, that they would have sufficient apricots to give them a crop and give them a good crop.

Q. A good crop? A. Yes.

Q. When you speak of setting, just what does that mean with respect to an apricot orchard, or the fruit?

A. That after the bud has bloomed and pollinizes itself, it keeps on growing and remains on the tree. If it does not set it will shrivel up and drop off.

(Testimony of William Lewis.)

Q. You mean it will shrivel up and drop off if it does not set?

A. If it does not set, and that will happen before the jacket breaks.

Q. The fruit comes from the buds that do set, is that it?

A. From the buds that do set, yes,—from the bloom that sets.

Q. From the bloom. Now, on this occasion in February, 1943, all you could observe at that time was the probable extent of bloom to expect on that day?

A. Yes, from the buds at that time.

Q. I understood you to say that there would be an expectancy of a good or a fair bloom that would cover the tree with white blossoms, is that it?

A. Yes.

Q. When next did you inspect or observe the Pista orchard after that occasion in February, 1943?

A. The first week in [45] March.

Q. The first week in March of 1943?

A. 1943. Mr. Anderson called me to his orchard and I went over and looked at the Pista.

Q. What, if anything, did you observe in the Pista orchard at that time with respect to blossoming or fruit setting, or expectancy or the like?

A. The Anderson orchard was ready for a spray. The Pista orchard looked like it would be a little bit light in blooming. It would be a few days later. Both of them could be sprayed at that time. It was in condition in that it would be justified in spraying them at that time.

(Testimony of William Lewis.)

Q. What is the function or purpose of spraying at that time?

A. They use a Bordeaux spray of copper sulphate and lime to control the Manila blossom rot, also known as the brown rot.

Q. On this occasion in March, 1943, what observation did you make with respect to buds or blossoms or the like that would assist in any way toward a crop estimate?

A. I do not make my estimates on bloom. I wait until they set, and that is around the first of April. The only thing would be an idea whether there was a chance of a set.

Q. On this occasion in March, 1943, what did you observe with respect to the chances of the set?

A. There was a chance of a set from the bloom.

Q. A chance of what per cent or degree or volume do you mean?

A. With favorable conditions and everything set you would have [46] nearly a normal crop.

Q. When you say a normal crop, and having in mind the Pista orchard there of apparently about 44 acres of apricot trees, what would you call a normal crop? Regardless of the year, what would you call a normal crop in terms of tons of apricots?

A. An above-normal crop would be 100 per cent. A normal crop would be around 80 per cent.

Q. I do not know in percentage what that means in tons.

A. You would figure a normal crop in there for

(Testimony of William Lewis.)

that year at the rate of 7 tons to the acre on 40 acres——

Q. 44 acres.

A. Yes, but I am figuring on 40, because I am making allowance for smaller trees and weak trees. That would be around 280 tons.

Q. On this occasion in March, 1943, from the observation you could make of the buds or whatever there was to observe, did it have the appearance of a chance, a good chance or otherwise, of 280 tons of apricots? A. He had a chance.

Q. When did you next observe the Pista orchard? Before I go on from that, in March, 1943, did you observe whether or not this white Perma-nente dust was still settling on the orchard?

Mr. Moore: You mean his visit in the first of the month?

Mr. Naus: No, I am speaking of this visit he has identified as sometime in the first week of March, 1943.

Mr. Moore: I just wanted to be sure what you were talking about.

A. Yes, I noticed the dust then on the ground and on [47] the tree buds.

Q. When was the next occasion you inspected or visited the Pista orchard after this occasion on the first week in March?

A. I was in this orchard nearly every week during March and up to the first of April, then again around the 20th of April.

(Testimony of William Lewis.)

Q. Were you there through blossom time?

A. I was.

Q. What would you fix, as best you can, as the approximate period or range of time of the blossoming in that Pista orchard in 1943?

A. In 1943 the blossoming extended over a long period, which ran about eighteen days.

Q. Was it a uniform period or was there an early blossom or late blossom?

A. There was practically three different blooms on all orchards in the district. It seemed to be a continuous bloom.

Q. Those three different blooms extended then, you say, over this period of eighteen days?

A. About eighteen days, yes.

Q. What inspection or observation or conclusion or estimate did you make or form during this period of these various weeks in March with respect to the expectancy or probability of crop or setting or the like?

A. The bloom, itself, was sufficient to give a crop. The first bloom came on, and as it continued through it seemed to develop into a second bloom. I noticed the cots, instead of growing from the bloom, they formed a cot with a jacket around it standing there, and with touch they would drop off. The same happened with the second bloom, and with [48] the last or the end of this practically continuous bloom, which was really in three heights during the blooming, the biggest portion of them

(Testimony of William Lewis.)

dropped off, although more set on that last bloom than did on any of the other two heights of the blooming period.

Q. Do you mean that the bloom was not developing into sets or setting?

A. It wasn't setting or developing into fertilized or pollinized cots.

Q. From your observation could you form an estimate or opinion or determine as to what, if anything, was preventing those apricot blossoms from setting into apricots—from failure of fertilization or pollinization?

A. That area had me puzzled.

Q. Pardon me? A. It has had me puzzled.

Q. I didn't get the answer.

Mr. Naus: "That area has had me puzzled."

The Witness: The whole county had an acreage of 20 per cent, most of it from 10 to 15 per cent, and the area in there brought the estimate up sufficient to make my estimate around 20 per cent. I made it 15 to 20 per cent for the county when I reported before the 1st of May, and the orchards down there, with the exception of the Anderson, and the Pista, and the Hill orchard, had a crop of cots, while not a normal crop, with the exception of the Bardin orchard, which came up nearly to normal—well, they came within a 60 per cent crop—why, the Anderson and Pista did not set, whether it was weather conditions or whether [49] it was dust.

(Testimony of William Lewis.)

Q. Have you ever made any studies with respect to the effect of *of* this settling of dust on fruit trees and blossoming?

A. The only true reference that I have read on that there, on fruit trees, was by Dr. Anderson, a synopsis in his "Plant Diseases," by Hill, and it speaks of the effect of magnesium and other dusts on the pollinization of apricots.

Q. What effect does it have?

Mr. Moore: Just a minute. Is he referring——

Mr. Naus: I do not know what he is doing.

Mr. Moore: I would like to voice an objection. I do not understand, your Honor. Is he testifying from his own knowledge or is he just testifying from what somebody else wrote or told him?

Mr. Naus: My question was, Mr. Moore, whether he personally ever made any study of it, and he started to give me in his answer something he read somewhere. I would be content if he would tell me if he has ever personally studied it. I do not think he has.

The Witness: Not on that particular dust, nor not on apricots. I have on other field products and other dusts.

The Court: Q. On road dusts, red spider?

A. Yes, your Honor.

Q. What else?

A. Road dust on your beans, on your almond trees, and on your fruit trees, on your prune trees—the red [50] spider, the weakening of the tree, the spider attacking that.

(Testimony of William Lewis.)

Mr. Naus: Q. Speaking of dust generally, without regard to the type of dust, or even using road dust, as his Honor has used, what effect have your personal studies shown it has on blossoms with respect to fruit setting and the like?

A. Not so much on dusts as I have on sprays.

Q. Are you prepared to say one way or the other, from your own studies or observations, whether the Permanente dust did or did not interfere with the setting of the fruit in the Pista orchard?

A. Something interfered with the setting of the fruit in the Pista orchard and in the Anderson orchard. The bloom in the Anderson orchard and in the Bardin orchard was practically the same, and the Bardin orchard set and the Anderson orchard did not set.

Q. Were they in the same area of rainfall?

A. The same area of rainfall, yes.

Q. In other words, the Bardin orchard had the same rainfall as the Pista or Anderson, and vice versa?

A. They did.

Q. So you can't explain it on that ground, can you?

A. No, I can't explain it on that ground.

Q. By the way, can you tell us anything with respect to the rainfall during the blossom period or the three bloom periods that you have spoken of in the spring of 1943 in these orchards?

A. We had a rainfall or foggy weather through the whole period. In fact, on the first bloom, as it

(Testimony of William Lewis.)

started, the rain stopped. [51] Some of the spray rigs for a few days were held up until they were late getting on their sprays in some of the orchards.

Q. Take the Bardin orchard. The Bardin orchard was not affected by this Permanente dust, was it? A. No.

Mr. Moore: What do you mean, affected? Do you mean was there dust on it or wasn't there, Mr. Naus?

Mr. Naus: Are you framing an objection?

Mr. Moore: I am framing an objection on the ground your question assumes facts not in evidence and it is indefinite.

Mr. Naus: I will reframe the question, now that I know the point of the objection. I was trying to avoid conversation.

Q. Mr. Lewis, in your observations of the Bardin orchard, did you or not ever observe whether any of the Permanente dust fell or set in the Bardin orchard? A. No, I never noticed it.

Q. You never noticed any dust there. So far as you know none of the Permanente dust fell in the Bardin orchard, did it? A. No.

Q. Do you know of any other difference, if there is any, between the Bardin and the Pista orchards, with respect to rainfall or other conditions other than the difference with respect to the Permanente dust?

A. There was a difference in the set of the bloom.

Q. Pardon me?

(Testimony of William Lewis.)

A. There was a difference in the bloom. [52]

Q. Yes, but I mean other than the physical differences and the like as to the bloom, did you ever notice any other difference between them other than this matter, if it did affect them, of the Permanente dust?

A. No.

Q. What set of apricots did the Pista orchard have as compared to whatever set it was that the Bardin orchard had?

A. Well, the Bardin orchard had about a 60 percent——

Q. 60 percent of what?

A. Of what you would call a full crop.

Q. And the Pista orchard had what percent?

A. Between a 5 and 10 percent.

Q. If we take that 60 percent, whatever that phrase may mean with respect to an apricot crop, if there had been the 60 percent set in the Pista orchard as in the Bardin orchard, what should that have produced in tons in the Pista orchard in 1943?

A. I gave you that before.

Q. Pardon me?

A. I gave you that before.

Q. I may have overlooked it. Will you give it to me now?

A. About 280 tons.

Q. You said a normal crop on that ranch would be 280 tons, is that correct?

A. On the Pista?

The Court: Let us approach it another way.

Q. You said a normal crop would be 280 tons?

A. For last year.

Q. For last year?

A. Yes, your Honor.

(Testimony of William Lewis.)

Q. 1943? A. Yes. [53]

The Court: That is what I thought.

Mr. Naus: Q. That is a normal crop under all the conditions that you observed?

A. Under the conditions, yes.

Q. Take the Anderson orchard, which, as I understand you, had the Permanente dust settling or falling upon it somewhat like the Pista orchard. What kind of a set did it have?

A. It had around an 8 or 10 percent set.

Q. Was that about the same, or better or worse than the 5 to 10 percent set for the Pista?

A. It would be a little bit better.

Q. Do you know of any reason why even if there should have been a slightly better set than the Pista, other than the dust, if that had caused it?

A. Well, it had a heavier bloom.

Q. There is a Bob Sterling orchard and a Lester Sterling orchard in that general area, is there not?

A. Yes.

Q. Are they in the same rainfall area?

A. In the same rainfall area, yes.

Q. Did either the Bob Sterling or the Lester Sterling orchard have any of this Permanente dust fall on it?

A. At the Lester Sterling I never noticed any, but I have seen some at the Bob Sterling, at the house.

Q. Now, the Lester Sterling orchard that you never saw any Permanente dust fall on, what did it do with respect to setting fruit?

(Testimony of William Lewis.)

A. It set what we could call a 40 percent crop.

Q. How did the blooms in the Lester Sterling orchard compare with the blooms in the Pista orchard?

A. Lester Sterling had a heavy [54] bloom on his orchard.

Q. Can you in a general or in an approximate way tell his Honor generally about how many apricot orchards there are within a radius of, let us say, ten miles from the Permanente plant in any direction?

A. Ten miles in any direction?

The Court: Approximately.

Mr. Naus: Q. Yes, just approximately. I want his Honor to know whether there are some other orchards we ought to deal with.

A. That runs into the Prunedale area, in the Prunedale district, where you have one- or two-acre abandoned family orchards all the way through. I can name the orchards on the other side.

Q. If they are simply one or two acres of abandoned family orchards I do not think we should pursue them. You mentioned a district. What district would you call it that the Anderson, the Pista, the Bardin and Sterling are in?

A. The Alisal and Natividad.

The Court: That is the name of the district?

The Witness: The two join. The Pista is right in the Natividad, but I do not know where the line comes in between the two of them. The Alisal comes right in. They are school districts. That is what it is.

(Testimony of William Lewis.)

Mr. Naus: Q. Does the Natividad and Alisal district comprise in area or not that, speaking generally, same physical, rainfall conditions and the like, soil and the like, with [55] respect to apricot growing?

A. There is a little difference in the soil in all orchards. There are no two orchards that have got the same soil.

Q. Then I will eliminate the soil comparison. Are they all the same in that district with respect to rainfall and other general conditions?

A. The Natividad area might be a little bit warmer than the Alisal.

Q. Is there any difference between them that you can think of offhand?

A. There is no other difference.

Q. In the Alisal and Natividad districts what other apricot orchards are there, disregarding those of an acre or two of family orchards—other than those that we have mentioned, if any?

A. There is that Kerns orchard on the Natividad road that belongs to a lady by the name of Mrs. Kerns. It is marked right here.

Q. Which one is that?

A. Right here (indicating), and there is another little orchard that sits back on the side of the hill that they don't take much care of, which we have practically eliminated from our reports.

Q. Aside from the Bardin orchard and the Bob Sterling and the Lester Sterling orchards, is there any other apricot orchard in these Alisal and Nativi-

(Testimony of William Lewis.)

dad districts that the Pista should be compared with for purposes of his Honor that you know of?

A. Not that I know of.

Mr. Naus: You may cross-examine.

The Court: We will take a recess for a few minutes.

(Recess.) [56]

Mr. Naus: If the Court please, I would like permission to reopen for a question or two of Mr. Lewis.

The Court: All right.

Mr. Naus: Q. Mr. Lewis, it appears in this case so far that in the season of 1940 the Pista orchard produced only 119 tons of apricots. You are familiar with that low production, are you?

A. I am.

Q. Will you state to his Honor, please, the cause or reason for such a low production as 119 tons from the Pista orchard in the season of 1940?

A. 1940 was a low production year. We had heavy rains around the time of the blooming season. Many of them could not get on their sprays in time. The brown rot, the blossom rot, hit fairly heavy, and the jacket rot or green fruit rot, also known as, I should say, as the green fruit rot, took quite a toll of the apricots and the set over the county was light in that year.

Q. Take those conditions that you describe as existing in the season of 1940 and resulting in the low crop, to what extent, if at all, did any of those

(Testimony of William Lewis.)

conditions exist or be comparable with the situation in the season of 1943? I want to compare one year with another and find out.

A. In 1943 we did not have as much Sclerotinia, or, I should say, brown rot, the rots. We had quite a little more foggy weather in 1943, even though we did not have any more rainfall; we had a colder and foggier condition in 1940. [57]

Q. Those disease conditions would you compare with 1943 in the Pista orchard?

A. In the Pista orchard in 1940 there was brown rot started, and there was considerable jacket rot in there. For some reason other than control—in most of the orchards we spray, but there is no control for your jacket rot by spray. The only control they have is cultivation to discourage the mushroom or aphitesia form of green rot or jacket rot. In 1943 there was very little jacket rot. My conclusion—I say “conclusion”—that was because jacket rot develops as the cot bursts the jacket and it has dried on there and has not fallen off, and then the wet weather comes in. The spore is in under the jacket, and then with the wet condition it develops, and rot starts in.

Q. Comparing 1940 with 1943, then, there was nothing that existed in 1943 in comparative conditions that should have produced such a short crop as 119 tons, was there, in 1943?

A. Would you ask that question again?

Q. Pardon me. I will reframe it. Comparing 1940 with 1943, the conditions that you testified as

(Testimony of William Lewis.)

existing in 1940, they did not exist in 1943 in a way that should have held the 1943 crop down to 119 tons? A. No.

Mr. Naus: You may cross-examine.

Cross-Examination

Mr. Moore: Q. Mr. Lewis, what territory is involved within your jurisdiction?

A. Monterey County. [58]

Q. The entire county of Monterey, is that correct? A. The entire county, yes.

Q. Is it a fact that throughout the county there was a short crop in 1943?

A. There was a very short crop.

Q. Very short crop?

A. 20 percent was the estimate.

Q. And I suppose various orchards varied with regard to their yield, is that correct?

A. They did.

Q. Were there any orchards in there that had as low a yield as the Pista orchard?

A. The whole Prunedale district.

Q. What is that?

A. The Prunedale district.

Q. The Prunedale district? A. Yes.

Q. Where is that?

A. That is north of Salinas in that hilly country, that sandy, hilly country.

Q. How many orchards are there in that neighborhood?

A. Well, that is just divided up into little

(Testimony of William Lewis.)

ranches, and I have never made a real count of the orchards.

Q. In that district what percentage of yield did they have there?

A. Some of them from a complete failure up to about 10 or 15 percent.

Q. They were complete failures——

A. Well, where you only get a half dozen cots to a tree I would call them a complete failure.

Q. Were there any number of orchards that ran from 10 to 20 percent?

A. In Monterey County?

Q. Yes. A. Yes.

Q. Can you tell us what orchards they were that produced between [59] 10 and 20 percent?

A. Well, you have the California Orchard for one. That was the largest orchard in the valley.

Q. The California Orchard? A. Yes.

The Court: Q. How many acres?

A. There are 406 acres, your Honor.

Q. Who is farming that?

A. That is a company.

Q. What company, do you know?

A. It is known as the California Orchard Company, and Arnold Prue is superintendent.

Mr. Moore: Q. What was their yield?

A. About 15 to 20 percent.

Q. 15 to 20 percent. They were not affected by any dust, were they?

A. They were not affected by any dust.

Q. This Fruitvale that you were talking about——

(Testimony of William Lewis.)

A. Prunedale.

Q. Was that affected by dust in any way?

A. No, it wasn't affected by dust in any way.

Q. What orchards in Monterey County that you observed were there where there was any evidence of dust from this plant?

A. The Pista, the Anderson, and some on the Bob Sterling. I have seen the dust on the Bob Sterling, but not at all times.

Q. What production did they have on the Bob Sterling ranch? A. About a 35 percent crop.

Q. 1943? A. In 1943, yes.

Q. About a 35 percent crop? A. Yes.

Q. And you noticed on that evidence of this dust, is that correct?

A. There was an evidence of the dust at different times. [60]

Q. Was there any evidence of dust on the Bardin ranch? A. No.

Q. That ranch is owned by the Bardin family?

A. Judge Bardin died here a little over a year ago, and his wife, Mrs. Bardin, is running the ranch now.

Q. And he was a partner of Mr. Harrington?

A. He was a partner of Mr. Harrington.

Q. You have worked on that ranch, have you not?

A. Yes; in fact, since 1941 they have called me in on practically all the work that they do on the apricot orchard.

Q. In other words, you have been employed by the Bardin family to supervise that ranch?

(Testimony of William Lewis.)

A. They get my advice.

The Court: Q. How many acres do they have?

A. 23 acres of full-grown apricots, and there are about 18 acres—18 to 20 acres of young apricots that are just starting to come in now.

The Court: Pardon me.

Mr. Moore: Q. So you are familiar with the Bardin ranch? A. Yes, I am.

Q. In 1943 when did it bloom? Can you tell us?

A. It started the first week in March.

Q. The first week in March? A. Yes.

Q. I understood you to say—

Mr. Naus: Q. You said it started?

A. Started.

Mr. Moore: Q. (continuing): —t h a t the Pista ranch was late?

A. Just a little bit later, yes. [61]

Q. How much later would you say?

A. I would say around five days later.

Q. Five days later than—

A. It would be around that time.

Q. The Bardin? A. Yes.

Q. Now, did the Bardin ranch have these three cycles of budding or blossoming that you described with the Pista ranch? A. Yes, they did.

Q. In each one of those cycles will you describe what occurred? By that I mean, in the first cycle did the buds all set? A. No, they did not.

Q. They dropped off?

A. They dropped. Most of the second and the last cycle set.

(Testimony of William Lewis.)

Q. On the Bardin ranch?

A. On the Bardin ranch.

Q. In other words, the behavior of the fruit on the Bardin ranch was exactly the same as on the Pista ranch, was it not? A. Yes.

Q. There was no difference; the whole process of nature was the same with the exception——

A. With the exception of the starting of the bloom—with the exception of the time that it started to bloom.

Q. I mean, the first cycle when these buds broke off both the Pista ranch and the Bardin ranch, they budded, did they? What happened?

A. The first cycle?

Q. Yes.

A. Just formed a little cot, stood there a few days, and dropped off.

Q. That happened on the Bardin ranch?

Q. That happened on the [62] Bardin ranch, too.

Q. That happened on the Pista?

A. That happened on the Pista, on the Lester Sterling, and on the Bob Sterling, and Anderson.

Q. Now, with the Bardin ranch what, in your opinion, caused those little cots to drop off?

A. Failure of the pollen to reach the pit. That would be my opinion.

Q. On the Bardin ranch? A. Yes.

The Court: Read that last answer?

(Answer read.)

(Testimony of William Lewis.)

The Court: Q. Of the fruit?

A. Of the fruit. May I explain that, your Honor?

Q. Certainly.

A. When a bloom opens, the cot is already formed there. It is very small. While you can't find the pit at the time, you can see where it is. There are soft—well, it is a liquid in there, and the pollen enters the pistil, travels down through, and it has got to get into there or it is not fertilized and will drop off.

Mr. Moore: Q. As I understand it, apricots to a certain extent are self-pollinizing, are they not?

A. They claim that.

Q. On the other hand, there is pollen carried to them probably by insects and likewise?

A. Yes.

Q. In other words, it is both self-pollinizing and also from outside pollinization?

A. Yes, that is correct.

Q. It is that pollen coming into the blossom, or even before [63] with self-pollinization, that makes the cot fertile, is that right?

A. If it travels down through there and enters the pit it makes it fertile.

Q. On this first cycle on the Bardin ranch your explanation is that that pollen did not reach the pit?

A. That is my opinion.

Q. Now, why didn't it reach the pit, do you know? Or what is known in regard to that?

A. My opinion was chilly weather at that time.

(Testimony of William Lewis.)

Q. Was what?

A. Chilly weather, cloudy, rainy, chilly weather.

Q. That stopped the pollinization. if we might term it that?

A. Yes.

Q. And that condition existed in all the orchards through that neighborhood, is that correct?

A. It did.

Q. In fact, in all the orchards in Monterey County that same condition existed, did it not?

A. That same condition existed.

Q. Now we come to the second cycle, the second blooming, if we want to call it that. Did exactly the same process take place with that on the Bardin ranch?

A. Not to as heavy an extent. Some of the second bloom set on the Bardin and on the Bob Sterling and on the Lester Sterling.

Q. Some of them, because they were not fertile, fell off, is that right?

A. That is right.

Q. Would you say that practically throughout Monterey County on the first blossoming or on the first cycle pretty generally all the young apricots fell off? Was that true throughout the county?

A. That was true throughout the county, and if I may go further to say in the southern part of the county, where it happened to be a little warmer, they did not have as long a cycle of bloom as we did in the northern end.

Q. And where is the Bardin ranch?

A. It is in the northern part in the Alisal.

Q. You said the Bardin bloomed approximately

(Testimony of William Lewis.)

five days before the Pista bloomed. Did it have about the same bloom as the Pista ranch?

A. About the same.

Q. In the second cycle, then, part of these unfertile cots fell off, is that true?

A. That is correct.

Q. And I suppose that varied somewhat throughout the county, is that correct?

A. That is correct.

Q. Now, with the Pista ranch did exactly the same process take place there that took place at the Bardin ranch on this second cycle or second blossoming?

A. The fall of the second cycle was heavier on the Pista than it was on the Bardin.

Q. Were there other orchards in Monterey County where the fall on the second setting was as poor as it was on the Pista?

A. The Anderson.

Q. Any others?

A. Let's see. In that area it ran just about the same. In the southern end of the county and in the area away from there, why, the second practically ended it, and what set they got, they got on the second—what we call the [65] second height of the blooming period.

Q. The second what?

A. The second height of the blooming or the second set—the blooming period, I guess you would call it, the second height of the blooming period.

(Testimony of William Lewis.)

Q. Then, as I understand you, they had a third stage, did they not?

A. We did up there in Alisal. The others, instead of going into a height, bloomed itself out at the other end.

Q. That is the southern end of the county?

A. The southern end.

Q. But the northern end——

A. The northern end went the same way.

Q. —had a third cycle?

A. The Prunedale area had a third cycle just the same.

Q. Did the Pista and Bardin have the third cycle, too?

A. Yes, they had the third raise on them.

Q. Will you describe what happened on the Bardin ranch with this third cycle or third blooming?

A. After the second cycle we figured there wasn't going to be a set. This third raise came up, and I made the inspection of the orchard I told the Judge and Mrs. Bardin that I thought they would have a crop. I waited ten days, went back and looked at it, and told them they would have to thin part of the orchard. In fact, I had to take the Judge out and show him there would be too many cots on part of the orchard.

Q. And those, if I understand you, came on this third cycle? [66]

A. Yes.

Q. Was there a change in the weather between the first, second and third cycles?

A. Yes.

(Testimony of William Lewis.)

Q. What happened?

A. There was a warming up there for a few days.

Q. As I understand you, with the fruit dropping off on the first and second blossoming it is your opinion that that was caused throughout that territory by cloudy, cold, foggy weather; is that correct?

A. That is my opinion.

Q. And that is true of that whole district?

A. Yes.

Q. Now, with the third blossoming the weather had warmed up somewhat?

A. It warmed up there for a few days.

Q. And out of that, when that warm weather came, the Bardin got a sufficient number to set that they even had to thin them out, is that correct?

A. Yes, they had to thin part of the orchard.

Q. Did you see what happened on the Pista ranch with regard to that third blooming?

A. The heaviest part of the set came on the third bloom on that, and on the Anderson orchard, although both of them was very light.

Q. Isn't that true in that whole northern district? The crops that were secured practically came on that third blossoming, did they not? Do I make myself clear?

A. I didn't just get the first part.

Q. I say, in that whole district, in that northern district, the [67] fruit that was finally produced came on that third blossoming very largely, did it not?

A. At least 60 per cent.

(Testimony of William Lewis.)

Q. The trees in the Pista orchard are somewhat diseased, are they not?

A. On the Pista orchard there is some oak root fungus.

Q. There is some oak root fungus?

A. And *Amelleria Mella*.

Q. On what portions is that oak root fungus found?

A. Well, you can find an occasional tree in different parts of the orchard, more so on the northern end. A tree affected with oak root fungus, as soon as the infection becomes heavy enough to cause any damage to your crop, immediately kills the tree. It affects the bark just under the surface of the ground, where the infection enters from the root.

Q. Are there any other diseased trees other than those that are affected with the oak root fungus in this orchard?

A. Not with an economical disease, other than if you want to say your brown rot that enters so many orchards.

The Court: Q. What is the brown rot?

A. That is that rot that enters the blossoms during rainy periods that they spray for.

Q. What is the oak root fungus?

A. Oak root fungus is a fungus that is in the ground that attaches itself to a root and travels on up the root to the main branch. Traveling up there it poisons the sap cells all the way up and

(Testimony of William Lewis.)

makes itself apparent so that you can distinguish it by the fan-shaped—we call [68] it mycele. It is a fungus disease that is in the ground.

Q. Would it be caused by too much irrigation?

A. No, your Honor, it is in the ground. It has been introduced or brought in by some oak tree.

Q. In adobe soil in a rainy season, an extremely rainy season, would that bring it about?

A. In adobe soil or an extremely rainy season where it would be too wet——

Q. Where there is no drainage.

A. Where there is no drainage, you would have an excess there which might hold——

Q. What would that cause?

A. It might hold that feeler or root that goes out and attaches itself to the live root; it might hold it back. But with ideal moisture conditions, as that moisture goes down your strand of mycele might stretch out then and attach itself to a tree.

Mr. Moore: Q. Did you observe any other diseased trees on the Pista orchard in 1942, 1943 and 1944 other than those that were attacked by the oak root fungus?

A. I saw one or two limbs with a disease that is known as the black heart; that is the common name for it.

Q. What type of disease is black heart?

A. Well, it is more of a virus or bacterial disease that enters the root, goes on up and causes the wilting of a limb, of which sometimes it recovers. It is known as a verticillus.

(Testimony of William Lewis.)

Q. Besides oak root fungus and the black heart did you notice any other diseased trees?

A. No, I did not. [69]

Q. In your opinion were the trees in healthy condition outside of those that you refer to as diseased trees?

A. You are speaking about 1942?

Q. 1942, 1943, and 1944, the last three years.

A. There was a condition in the fall of 1943 that is not clear yet to me. I have to watch it for a year or so more. There is a kind of brittleness of the small branches that I cannot just place my finger on at the present time. I called the attention of that to Mr. Packard when we were in there in the spring of 1944. It is just noticeable and that is all. Now, whether that is going to continue or increase, or whether it is some other condition, I have got to watch it to find out, because there is no way to determine that only by observation.

Q. Aside from that and the black heart and the oak root fungus, you would say the trees were in healthy condition?

A. Yes. May I go further on that?

Q. Oh, surely.

A. I explained to Mr. Packard at the time that there was a question in my mind that spraying with Bordeaux would cause a brittleness of leaves. That is why they have eliminated the Bordeaux and are using copper oxide in the control of blight, and on tomatoes we have a certain transformation there that has a tendency to stunt the tomato. That is

(Testimony of William Lewis.)

why they are using copper oxide and getting away from the lime. What I am watching for is to see whether that is going to increase, and it will be up to a chemist to determine whether [70] it is a lime or what it is that is causing it.

Q. Bordeaux mixture is made out of what?

A. Lime and copper.

Q. Copper sulphate?

A. Bluestone, yes—copper sulphate, commonly known as bluestone.

Q. That has been a common spray used in spraying apricot trees for generations?

A. I started to use it in 1922.

The Court: Q. Are they using it now?

A. They are using it on apricot trees before the foliage comes out, and in an emergency where you have to use something, where it is take your stunting or control the fungus; sometimes you have to use it when you would just as soon use something else, as it is the most perfect fungicide we have run into, or a control to give a perfect control of any of the fungi.

Q. Who sprays these ranches?

A. They do their own work, your Honor.

Q. That was a pressure spray?

A. A pressure spray, yes.

Mr. Moore: Q. The Bordeaux mixture is in about what proportion of lime and copper sulphate?

A. They use from what is known as a 5-5-50—that is, 5 pounds of copper sulphate, 5 pounds of lime, and 50 gallons of water—up to 8-8-50, which

(Testimony of William Lewis.)

is 8 pounds of lime to 8 pounds of copper sulphate to 50 gallons of water.

Q. In other words, outside of the difference in the water, the lime and the copper sulphate are constant, that is, they are even with each other?

A. They are even, yes. That is our [71] recommendation.

Q. What sort of lime is it that is in the Bordeaux mixture? A. You mean dehydrated?

Q. I mean slaked.

A. They can use slaked if it is properly slaked, or they can use a little raw lime, slake it in water. and have it perfectly slaked before they add it to the tank.

Q. It should be slaked before being placed on the tree?

A. It has to be, otherwise you would not have a neutral copper.

Q. They spray with that at the time of blossoming, do they?

A. It is advisable to get it before many of your buds have gone out of the pink stage to the white or blossoming stage, because after the bloom is open, as soon as that petal shows, it is in a conditions then that it can be infected.

Q. You say it is advisable to do it just before blossoming. At times is spray put on during the blossoming period?

A. Yes; some of them use two sprays. They use a 4-4-50, or sometimes they drop one pound of lime, and I have seen them use as low as one pound

(Testimony of William Lewis.)

of lime to two pounds of copper, but you are getting too near the danger point there and have free copper when you get down that low.

Q. Maybe I did not hear you correctly. Do some orchardists spray with it during the blossoming period?

A. In severe winters sometimes they do.

Q. That is a spray that is put on, as his Honor asked you, by a pressure rig?

A. By pressure, yes. [72]

Q. What pressure is usually used in spraying?

A. They use over— —

The Court: Q. It depends on the machinery you have?

A. That is correct; it depends on the machine. With good machines they try to run from 450 to 500, so they can ride the rig.

Q. So I can see *how* are progressing in that country, how many of those machines have they down there?

A. Practically every orchard, your Honor.

Q. That machinery has come into use in recent years, hasn't it, that pressure?

A. The first machine I bought was a low-pressure, second-hand rig in 1923.

Q. I like the country so well I keep my eye on it if I can. The first pressure spray that I saw, it seems to me, with a 450-pound pressure was possibly six or seven years ago. I do not recall seeing them before that time.

(Testimony of William Lewis.)

A. I never saw them before that time up to 450. That was when the Hardy and Beeman came out.

Q. I just wondered how far behind I was.

A. They carry 600 pounds pressure putting oil on carrots.

Mr. Moore:: Q. With the Pista orchard in 1943 do you happen to know when he sprayed there?

A. I can't give you the exact date. I remember it was, if not the end of the first week, the start of the next week of March. It was right in about that time.

Q. Was it before——

A. I may be mistaken. [73]

Q. To the best of your recollection was it before or after the blossoming had commenced?

A. It was just before the bloom started to open up.

Q. Just before? A. Yes, in 1943.

Q. In your direct testimony you said, if I understood you correctly, that you visited the Pista ranch late in February and you also visited it the first week in March 1943. A. Yes.

Q. At which one of those visits was it that you observed the spraying taking place? The March visit?

A. When the spraying took place was—I know it was between one of the visits when he started putting it on, and it must have been just after the second visit.

Q. Just after the second visit?

(Testimony of William Lewis.)

A. Just after the second visit, yes.

Q. When you say "just after," that would be the visit in March?

A. Yes, that would be the first week in March.

Q. You say it was just after——

A. I am not sure of that, but as I remember.

Mr. Naus: Mr. Moore, he has already testified on direct to several visits in March.

Mr. Moore: I realize that. I am just trying to fix this particular date, that is all.

Q. How about the Anderson orchard? Do you recollect when the spraying occurred there?

A. That was just after the first of March. [74]

Q. How about the Bardin? When did you spray there?

A. The Bardin ranch was started in February, the latter part of February.

Q. I believe you said that when you visited this at that time, or along in March, it gave evidence that it would make a normal crop, is that right?

A. I said the prospect was that they could have a normal crop.

Q. At that time? A. Yes.

Q. And you estimated that normal crop at seven tons to an acre for 40 acres, is that right?

A. For that orchard for that year.

Q. That would be what you would call 280 tons?

A. Yes.

Q. 280 tons would be a normal yield?

A. Following the crops of the year before, that would be a normal crop for that year.

(Testimony of William Lewis.)

Q. Was the yield on the Lester Sterling ranch or orchard 40 per cent?

A. Lester Sterling had about a 40 per cent crop if he had picked it all. He picked about 30 per cent.

The Court: When was this? 1943?

Mr. Moore: 1943 I am referring to.

The Witness: Yes, 1943, your Honor.

Mr. Moore: Q. How about the Bob Sterling? What was his crop?

A. I estimated it in April at about a 35 per cent crop.

Q. What did he actually get, do you know?

A. He didn't quite get that much. I doubt if he got over 30 per cent.

Q. What did Mrs. Kerns' ranch do?

A. Mrs. Kerns' ranch is one [75] that is not being taken care of or not being sprayed, that I didn't even waste any time on.

Q. What is that?

A. I didn't even waste any time on that, any more than to look to see what brown rot was in there. They haven't taken care of that orchard. It is only a little orchard.

Q. Don't you know what——

A. I don't know what her tonnage was, whether she picked anything off of it or not.

Q. What was Wilmouth? Did you observe that?

A. Yes, but I don't know what his tonnage was.

Q. How about the Hill orchard?

A. The Hill orchard was very light.

(Testimony of William Lewis.)

Q. What would you say the Hill orchard produced? A. In tonnage?

Q. Yes, or percentage, percentage of normal—any way you want to put it.

A. Not over 10 tons.

Q. Over 10 tons? A. Not over 10 tons.

Q. What would that be, what percentage of a normal crop?

A. That would be 10 or 15 per cent. I will say on the Hill ranch I did not visit it very much.

Mr. Moore: I do not know what time your Honor wants to adjourn.

The Court: Do you think you can get through today?

Mr. Moore: I think so.

The Court: All right; I yield. I will give you a reasonable time. If you do not think you can get through, I will adjourn. [76]

Mr. Moore: Q. Did you want to go back tonight, Mr. Lewis? A. If I could.

Q. How about the 1944 crop? What were the weather conditions this spring?

A. We had ideal conditions this spring.

Q. Ideal weather conditions?

A. Weather conditions, yes.

Q. There was a very high percentage of crops that were fertilized and steady on the trees, isn't that correct? A. Very high.

Q. In fact, would it be going too far to say that in practically every orchard in Monterey County this year they had to thin them out?

(Testimony of William Lewis.)

A. In nearly all.

Q. In nearly all? A. Yes.

Q. Did you see the Pista orchard this spring?

A. Yes, I did.

Q. What kind of a yield did he have there?

A. This year I missed my estimate on all orchards in the county. The Pista had a very good stand except a few of the trees just after you cross the Gabilan Creek, and to the left in there there were some trees, and a few right there before you cross the creek on your left, that would need no thinning in there. The rest of them needed thinning.

Q. You had a very heavy crop, as a matter of fact, did you not? A. Yes.

Q. It took a very considerable amount of thinning on his part, to thin the fruit out, did it not?

A. On all orchards, practically all orchards. [77]

Q. In other words, the fertilization there this year was fine? A. Yes, it was.

Q. And as you say, the weather conditions this year were ideal?

A. Was ideal. We had foggy weather, but we did not have the cold rain.

Q. You referred to the California Orchard Company as I believe you said one of the ranches that got about 10 per cent. A. About 20.

Q. About 20? A. 15 to 20 per cent.

Q. They have two ranches in Monterey County, have they not?

(Testimony of William Lewis.)

A. You mean the Carlisle-Thorpe and the California Orchard?

Q. I didn't understand you.

A. Do you mean the Carlisle-Thorpe and the California Orchard?

Q. I don't know. I understood the California Orchard has two separate orchards in Monterey County.

A. It is on the same ranch, unless you are referring to the Carlisle-Thorpe across the Greenfield Road.

Q. Yes. A. Yes.

Q. One of those had a very much heavier yield than the other, did it not? A. Last year.

Q. 1943? A. Yes, it did.

Q. And they are practically adjacent to one another, are they not?

A. They are, I would say, a mile and a half to two miles separating them.

Q. How many times did you irrigate at Bardin's during 1943? [78]

A. Once before the fruit was picked and——

Q. Can you tell us approximately when?

A. Just before the 20th of May—tried to finish up by the 20th of May.

The Court: The fruit——

The Witness: The fruit—a year ago he started picking around the first of July.

Mr. Moore: Q. Do you know whether Pista irrigated in 1943?

(Testimony of William Lewis.)

A. I didn't notice Pista irrigating until after the fruit was off towards the fall.

Q. That was in the fall?

A. Yes, that was in 1943.

Q. 1943 I am referring to. A. Yes.

Q. Did you cultivate the Bardin ranch in 1943?

A. Well, they cultivated it, yes.

Q. When did they do that, do you know?

A. Just after the Bordeaux spray was put on.

Q. Do you know whether Pista cultivated in 1943?

A. I can't recall now whether that was cultivated or not at that time.

Q. When you were on the property in 1944, this year, did you see evidence of dust on the orchard?

Mr. Naus: Do you mean from Permanente?

A. Not to any excess; not to any excess in 1943.

Mr. Moore: Q. In 1944?

A. In 1944—pardon me. In 1944 I didn't see it to any excess.

Q. But you did see dust on the orchard?

A. There was a [79] little, yes. That is, it was on the ground—I didn't notice it on the trees—and some on the buildings.

Q. Did you look at the leaves on the trees to see whether they had dust on them in this year?

A. You could see just a little, but on the fruit at picking time I didn't see a particle of dust. I didn't notice a particle of dust on the fruit.

Q. In 1943 was there dust on the trees?

A. Yes, there was.

(Testimony of William Lewis.)

Q. In a greater amount, was it?

A. To a greater amount.

Mr. Moore: I think that is all, your Honor.

Mr. Naus: I will try to finish quickly.

Redirect Examination

Mr. Naus: Q. In other words, Mr. Lewis, in 1944, as compared to 1943, in the Pista orchard there was a great falling off in the quantity or volume of the Permanente dust, in the Pista orchard?

Mr. Moore: I object to that.

Mr. Naus: Q. So far as you could tell by using your eye?

A. By using my eye, yes.

Q. That is what I mean. I have no idea of the percentage or anything of the sort, but it was a perfectly obvious or apparent fact, wasn't it?

A. Yes.

Q. This California Orchard Company, the two orchards that you mentioned about a mile and a half apart, how far is that from the Permanente plant, roughly? A. About 37 miles.

Q. Is it or not in a wholly different district than the district [80] that the Pista orchard is in?

A. It is entirely different.

Q. Is there or not any uniformity in percentage of apricots setting or in crops, that covers or blankets the county as a whole, or does it vary at various spots within the county?

A. In figuring percentages, every area is dif-

(Testimony of William Lewis.)

ferent. Prunedale is, if I may go to the extent of explaining, an area that should never have had cots in it. The Natividad and Alisal area produces a very good shipping cot. The Greenfield area produces a good shipping cot. But on account of a high humidity down there, hotter weather, they have to be more careful in handling that than they do up in the Natividad and Alisal area, for the reason that with the heat your cots ripen faster. There is less danger of your different rots during shipment, during the hot spell in the Greenfield or King City area, while there is a danger of your brown rot on apricots in the Alisal and Natividad area, especially if you have your water on too late in the spring like, say, after the 20th of May. You get over the danger line, because most years your apricots come in the first of July. This year they didn't come in until the first of August, which increased our tonnage and upset my estimate on it. I was figuring on most of those orchards 12 to 14 to the pound, when I put in my apricot estimate to the department, and when they finally picked it they ran 10 to 12 to the pound.

Q. In other words, this year, 1944, there was an unusually late [81] harvest season?

A. It was an unusually late harvest season.

Q. What district do those California Orchard Companies lie within?

A. That is the Greenfield and King City area.

Q. In the year 1943 you spoke of the Bardin

(Testimony of William Lewis.)

orchard having 23 acres in full bearing, as I understood you. A. Yes, I did.

Q. In the year 1943 what tonnage was harvested from those 23 acres? A. About 135 tons.

Q. That Bardin orchard is roughly just about half the size of the Pista orchard, isn't it?

A. Just about half the size.

Q. Now, you spoke of some oak root fungus and black rot—— A. Black heart.

Q. —black rot on one or two limbs in the Pista orchard. The Pista orchard, we understand, has about 44 acres. It runs about 70 trees to the acre, doesn't it, roughly?

A. Pretty close to it, not quite.

Q. There are somewhere around 3000 or 3100 trees in the orchard, then, apricot trees in the Pista orchard? A. Yes.

Q. Of those 3000 or 3100 trees what would you say is the maximum number of trees affected by any of the diseases that you have mentioned as having observed in the orchard?

A. Any tree that is noticeable with oak root fungus is dead. A tree affected with black heart—now, the term "black heart" can be used for different diseases. We use a technical term on it to identify that fungus. There were two trees I noticed with that there. Otherwise I couldn't say there were any other [82] diseases.

Q. Just two trees out of the 3000 or 3100, is that right?

(Testimony of William Lewis.)

A. That was affected with disease. There are weak trees and there are strong trees, but that will be in any orchard.

Q. In other words, of the 3000 or 3100 trees, outside of a couple all were in a healthy, full bearing condition, is that correct?

A. Yes, with the exception of those that were dead. Pardon me.

Q. About how many would that be? Outside of the 3000 or 3100 could you give his Honor an estimate of the total number of the trees that you now refer to?

A. No, I couldn't.

Q. Would it be less than 100?

A. Yes.

Q. Would it be less than 50, do you think?

A. It would be less than 50; it would be less than 25 at the present time, because they would pull them as soon as they were dead or nearly so.

Q. Then 25 or 50, whatever the number is, would be the total number affected by the oak root fungus, wouldn't it?

A. Yes.

Q. Now, you have been asked about spraying, irrigating and the like. I will ask you this question: From all the observations you have made of the conduct, the handling of the Pista orchard, has the Pista orchard through the years been handled in a good, effective, efficient, farmerlike way?

A. It has.

Q. Through the years that you have observed it have you any criticism of either the spraying or the irrigating in the Pista [83] orchard?

(Testimony of William Lewis.)

A. Well, after the fruit crop came in last year I thought it should have been watered a little sooner than it was.

The Court: Q. What is the purpose of the watering?

A. To build up your tree and build up your buds for the next year, and hold your root system so it won't get dry, although I may be wrong on that, because we had a wet winter, and there could have been sufficient moisture underneath.

Mr. Naus: Q. What you are referring to might have affected the 1944 crop, but it could not have affected the 1943 crop, isn't that correct?

A. It could, yes.

Mr. Naus: That is all. May the witness be excused, unless Mr. Moore wants him further?

Mr. Moore: I do not think I will want him any further.

Mr. Naus: I did not want to hold him here unnecessarily.

The Court: We will adjourn until tomorrow morning.

(Thereupon an adjournment was taken until tomorrow, Wednesday, September 13, 1944, at 10:00 a. m.) [84]

Wednesday, September 13, 1944,
10:00 O'Clock A. M.

Mr. Naus: Shall I proceed?

The Court: You may proceed.

Mr. Naus: Call Mr. Twining.

F. E. TWINING,

called as a witness by Plaintiff; sworn.

The Clerk: Q. Will you state your name?

A. F. E. Twining.

Direct Examination

Mr. Naus: Q. Mr. Twining, you are located in business where?

A. Fresno.

Q. What kind of business?

A. Chemical and physical laboratory, sir.

Q. Your laboratories operate under what name there? A. The Twining Laboratories.

Q. How long have you been engaged in the business of the Twining Laboratories at Fresno?

A. Well, I have had laboratories in Fresno for forty-six years—in 1898.

Q. Speaking generally, what is the nature of the business conducted by those laboratories during that period?

A. Our laboratory handles a general line of scientific research work. It is the largest laboratory run on the Pacific Coast, and very well equipped.

Q. Is that or not conducted under your personal supervision or [85] direction? A. Yes, sir.

(Testimony of F. E. Twining.)

Q. Have you through the years at any time made any studies or experiments or tests with respect to the effect of deposits of dusts of various kinds on fruit trees? A. A number of them.

Q. State generally to his Honor so he will understand, over what period of years you conducted those, and of what nature, just generally?

A. I would state that in various forms of dust we have made examinations, oh, over a period of at least thirty years, and very intensive studies in the last ten years.

Q. And those studies have embraced what types or species or kinds of dust?

A. Well, a number of cement plants—we did the work for both the cement companies and ranchers in the immediate district, there.

Q. In California? A. Yes.

Q. Have you made dust studies in connection with fruit orchards?

A. These were principally orchards.

Q. Have you made studies, or experiments, or tests with respect to Mr. Pista's orchard that we referred to in this case, the apricot orchard near Salinas?

A. I made a number of examinations and trips through this orchard.

Q. When? A. My first trip to the orchard, itself, was on the 14th of March of this year.

Q. The 14th? A. Yes.

Q. That was one trip. Have you made other trips? A. There have been two trips. [86]

(Testimony of F. E. Twining.)

Mr. Moore: Pardon me. Did you say March 14th——

Mr. Naus: Q. I think you said March 14th——

A. March 14th, May 22nd and August 1st.

Q. Of 1944? A. Yes.

Q. Prior to actually making personal trips to the orchard, itself, did you or did you not ever test or examine any vegetation, foliage, leaves, and the like from that orchard? A. Yes.

Q. When?

A. In December, 1942. I had some foliage from trees sent to me to determine what the white deposit was on these leaves.

Q. You mean sent to you by Mr. Pista?

A. Yes. They came through.

The Court: Q. That was in 1942?

A. In 1942, yes.

Mr. Naus: Q. December, 1942. Now, was there any other foliage sent to you after that occasion in December, 1942 and before your personal visit in 1944?

A. Yes. This foliage in 1943 was sent to me after my visit in 1944.

Mr. Moore: I do not want to interrupt——

Mr. Naus: But you are interrupting.

Mr. Moore: I know that.

Mr. Naus: What is it you wish?

Mr. Moore: I did not get the dates straight.

Mr. Naus: I am trying to get them straight. I am trying to give his Honor first the dates. Now, the witness has given them straight. The difficulty

(Testimony of F. E. Twining.)

I think has been in the recep- [87] tion. He gave the three dates in 1944 that he actually visited the field.

Mr. Moore: That is correct.

Mr. Naus: Prior to any visit to the field he first received foliage, leaves, and the like in December, 1942.

Mr. Moore: Q. That is correct, is it?

A. Yes.

Mr. Naus: And that he has further testified that after he had visited, at some time visited the field in 1944 there were turned over to him some samples that Mr. Pista had taken as of 1943.

Q. Have I fairly summarized your testimony?

A. Yes, that is correct.

Q. Now, Mr. Twining, in your examination of this vegetation that was sent to you in December, 1942, I think you said to determine what this white dust that was on there, what did you find it to be?

A. I found it to be a dolomite, that is, a combination of magnesium and calcium carbonate.

Q. Have you a memorandum, or did you make a report of the analysis of that?

A. I only have—I have a copy of a letter that was written.

Mr. Naus: If your Honor will permit me, I will submit to Mr. Moore the original report that Mr. Twining made to Mr. Harrington, at Salinas, the attorney, and if there is any objection to the whole of the report, the narrative going in, I will ask the witness to detach the chemical analyses and we will

(Testimony of F. E. Twining.)

put [88] those in. I am willing to use the whole or just take out the analyses, themselves, if it is desired that way.

Mr. Moore: May we have about a five-minute recess?

The Court: We will take a recess.

(Recess.)

Mr. Naus: If the Court please, before proceeding with the witness, Mr. Welsh, the Clerk, has reminded me about the reporter's transcript, which has not yet been mentioned. Arrangements have been made with the Court Reporter to give each side a copy and a third copy, original, or whatever it is, to the Court, each of us paying half of the cost, and I suggest if that be agreeable all around, the Judge's copy be placed on file with the Clerk.

Mr. Moore: That will be satisfactory.

Mr. Naus: Q. Mr. Twining, you made a report to Mr. Pista or to Mr. Harrington, his attorney, an original report dated March 31, 1944, and you recognize that as that report, do you not, the original of it? A. Yes.

Mr. Naus: I ask that it be marked for identification.

The Court: Let it be marked.

(The report was marked Plaintiff's Exhibit
4 for Identification.)

Mr. Naus: Q. Then at a later time, dated as of August 8, 1944, you made a supplement to that report or a supplementary report and you recognize this as it, don't you?

(Testimony of F. E. Twining.)

A. Yes. Do you [89] want an explanation?

Q. No, I just want to identify that. You recognize that as a supplementary report, don't you?

A. Yes.

Mr. Naus: I ask that it be marked for identification.

(The document in question was thereupon marked Plaintiffs' Exhibit 5 for Identification.)

Mr. Moore: May I say something?

Mr. Naus: Yes.

Mr. Moore: During the recess Mr. Naus and I discussed this matter. It is a scientific matter. And we have asked the privilege of studying these reports that Mr. Twining has made, and that is the reason he has marked them for identification. We are not going to make any objection to their admission other than we would like to have the opportunity to have them studied over the noon hour, your Honor.

Mr. Naus: I stated to Mr. Moore, if the Court please, that the reason I had not torn out the chemical analysis in the first place is that I am reluctant to take a document apart. So in order to meet the present situation, I suggested I would ask that each document be marked for identification, and then as to chemical analysis and the like figures, I would offer in evidence the separate page containing that, without regard to the narrative elsewhere in the report; that if it be desired that the whole report go in, naturally I would welcome it. If there

(Testimony of F. E. Twining.)

is any objection to it, I would approach the matter in [90] another way.

I also stated to Mr. Moore that if your Honor would grant him permission at today's noon recess I would have no objection to the Clerk giving custody of these exhibits for identification to Mr. Moore until 2:00 o'clock. Does that cover it?

Mr. Moore: That covers it.

Mr. Naus: Q. Mr. Twining, your original report is now called Plaintiffs' Exhibit No. 4—we will call it that—the supplementary report is No. 5. On pages 3 and 4 of Exhibit 4 there are the detailed data, figures and the like, of an analysis or analyses. Which samples or what vegetation were the subject of that analysis or those analyses?

A. This is the vegetation I took when I made my trip in March.

Q. In March of 1944? A. March of 1944.

Q. Give me that date in March again?

A. The 14th.

Q. That analysis of vegetation was of vegetation taken by you personally from the Pista ranch on March 14, 1944? A. That is correct.

Mr. Naus: I offer in evidence those pages 3 and 4 of Exhibit 4 for Identification.

Mr. Moore: I would like to reserve my objection. I do not think I am going to make an objection when I get through, but I would like to reserve it at this time.

The Court: Very well, it will go in subject to a motion to strike. [91]

(Testimony of F. E. Twining.)

Mr. Naus: I won't attempt to take up your Honor's time reading that. It consists of figures and percentages, and perhaps I can cover it in another way than by reading it.

(Pages 3 and 4 of Exhibit 4 for Identification was received and marked Plaintiff's Exhibit 6 in evidence.)

Mr. Naus: With your consent, Mr. Moore, I would like to take this Exhibit No. 5—and with his Honor's consent—I notice the five pages are not numbered—I would like to number them now.

Mr. Moore: That is the supplemental report?

Mr. Naus: That is the supplemental report and Mr. Clerk, I will put 1, 2, 3, 4, and 5 in circled pencil in the upper right-hand corner of each page.

Q. Mr. Twining, I hand you Exhibit 5 for Identification and direct your attention to the page numbered 3 on that, that relates to a sample of dolomite ore. When and where was that sample taken?

A. That was taken below the quarry—was that page 3?

Q. That is what I have numbered 3.

A. That was taken below the quarry.

Q. What quarry do you mean, the Permanente plant quarry? A. That is right.

Q. On the Permanente property? A. Yes.

Q. When was that taken and by whom?

A. That was taken August 1st.

Q. What year? [92] A. This year, 1944.

(Testimony of F. E. Twining.)

Q. Did you analyze that sample of ore from the Permanente property? A. Yes.

Q. Is this page 3 a true analysis of it?

A. Yes.

Mr. Naus: I offer in evidence that page 3.

Mr. Moore: May that take the same course as the previous exhibit?

The Court: Yes.

(Page 3 of Exhibit 5 for Identification was received in evidence.)

Mr. Naus: Q. I now invite your attention to page 4 of that Exhibit 5 for Identification and ask what those samples were and when and where they were taken?

A. These were taken on the 22nd of June.

Q. What year? A. This year, 1944.

Mr. Moore: I have not seen it, Mr. Naus. Can you identify it some place? You say "these samples." Samples of what?

Mr. Naus: Mr. Moore, each of these pages has a legend at the time that identifies the sample, but I will cover it. They are self-explanatory in that respect.

Mr. Moore: Don't you think having it in the record would help?

Mr. Naus: I am offering it in evidence, and it will be in the record, and it will help. But in the meanwhile I would like to lay a foundation for it so later, when the record is [93] gone over with a fine-tooth comb it won't be said I failed to prove something.

(Testimony of F. E. Twining.)

Mr. Moore: Mr. Naus, I do not know whether you are talking about dolomite ore——

Mr. Naus: I am not talking about dolomite ore; I am talking about dolomite deposits on vegetation.

Mr. Moore: May I add to that page 4 shows a heading, "Samples, branches from apricot trees taken by F. E. Twining and J. S. Pista, June 22, 1944."

Mr. Naus: It is not in evidence. There is nothing in the record that tells us that yet.

Mr. Moore: I just want to get it identified in the record.

Mr. Naus: It is already identified. It is in the custody of the Clerk with exhibit numbers and the page numbers referred to. There is full identity.

Q. Will you answer the question, Mr. Twining?

A. Let us have that question.

(The reporter, reading:

"Q. I now invite your attention to page 4 of that Exhibit 5 for Identification and ask what those samples were and when and where they were taken?"')

A. These were samples of foliage from the apricot trees on the Pista orchard taken on May 22, 1944.

Mr. Naus: Q. May or June 22nd? The paper here says "6."

A. June 22nd—sixth month. I have sixth month here. [94]

Q. Taken off the trees as live leaves at that time?

(Testimony of F. E. Twining.)

A. Yes, that is correct.

Q. Now, is the chemical analysis appearing on page 4 a true result of the analysis made in your laboratory?

A. One column shows the amounts on the apricots and another column the amounts on the leaves.

Q. My question is, is it a true analysis, a true result of the analysis? A. Yes.

Q. In the left-hand numerical column you have "Apricots" there. That means the fruit, itself, does it? A. Yes.

Q. And then in the right-hand column, where it says, "Leaves," are the leaves from the apricot trees that the fruit came from? A. Yes.

Q. And similarly, I invite your attention to page 5 of that Exhibit 5 for Identification and ask the same question with respect to it: What the samples were and when and where they were taken.

A. Those are samples of apricots and leaves taken on August 1, 1944.

Q. From the Pista orchard?

A. At the Pista orchard. They were picking at the time.

Mr. Moore: May I make a statement, Mr. Naus? I will withdraw my former statement and let them go in, not for identification, but let these reports go in as evidence. Of course, any conclusions he has made——

Mr. Naus: The Court is not bound by any conclusions. [95] That simplifies it. I will come to that in a moment.

(Testimony of F. E. Twining.)

Q. Just to complete what was left in mid-air here, are the analytical results shown on that page 5 of Exhibit 5 the true results of those analyses of the leaves and fruit from the Pista orchard?

A. Yes.

Mr. Naus: I at this time offer in evidence Plaintiffs' Exhibit 4 for Identification.

The Court: It may be admitted and marked.

(The document referred to was received in evidence and marked Plaintiffs' Exhibit 4.)

PLAINTIFFS' EXHIBIT No. 4

The Twining Laboratories

We Test Anything

Telephone 3-2118

2527 Fresno Street, Fresno, California

Analysts	Address Mail to
Industrial Chemists	P.O. Box 1472
Testing Engineers	Fresno 16, California

March 31, 1944

The following is a brief report on examination of Pista apricot orchard on March 14, 1944, and it was definitely shown that deposits of dolomite were present on the vegetation.

Experiments and field examination of dusts containing soluble lime and/or magnesia have demonstrated positively that the soluble lime prevents pollination and fertilization of the blossoms and that most of the damage to the fruit crop is done

(Testimony of F. E. Twining.)

during blossoming time. However, deposits of dust on what fruit does develop seriously affect value and price of same.

It was shown that dust from Permanente plant was being slowly deposited at time of investigation (March 14), and that damage to this year's crop will occur. Just what percentage can be approximated after petals have fallen and fruit begins to drop.

Examination

B48154

For—Mr. B. Pista

Watsonville, California

An examination on March 14, 1944, of an apricot orchard of 53 acres including some of the other vegetation in and around same, belonging to B. Pista, and located about one-half mile north of calcining plant and dolomite quarries of the Permanente Co., showed the following conditions:

(These properties are located in Natividad District of Monterey County, California.)

The orchard was in bloom but it was apparent that blossoms were less in number than the average apricot orchard. Little foliage was on apricot trees at this time, but leaves from an orange tree and several oaks showed white encrustations on upper side.

Grasses and weeds along ditch were well advanced in growth and samples washed with acidulated water showed presence of dolomite. Also

(Testimony of F. E. Twining.)

samples of upper layer of soil taken in undisturbed portion of orchard, also where no spray material would be deposited, showed presence of considerable greater quantity of lime and magnesia than deeper portion.

SAMPLES—DEPOSIT ON OAK LEAVES, CITRUS LEAVES, AND WEEDS

No. 1: Oak leaves, small sample

No. 2: Citrus leaves

No. 3: Weeds, Wong creek, north of house

No. 4: Oak twigs and leaves, large sample

	No. 1	No. 2	No. 3	No. 4
Weight of sample, grams.....	20.4	9.5	27.2	65.0
Total weight of deposit, grams.....	0.794	0.162	0.026	2.603
Percent on vegetation	3.89	1.71	0.09	4.00
Total weight of calcium carbonate (CaCO ₃) grams	0.514	0.109	0.015	1.432
Percent in total deposit	64.7	64.3	57.7	55.0
Percent in vegetation	2.52	1.10	0.05	2.20
Total weight of magnesium carbonate (MgCO ₃), grams	0.103	0.025	0.008	0.176
Percent in total deposit	12.9	15.4	30.7	6.8
Percent on vegetation	0.50	0.26	0.03	0.27
Total weight of silica (SiO ₂), grams	0.117	0.004	0.001	0.544
Percent in total deposit	14.7	2.4	3.8	20.9
Percent in vegetation	0.57	0.04	0.003	0.84
Total weight of iron and alumina (R ₂ O ₃), grams	0.051	0.020	0.001	0.327
Percent in total deposit.....	6.4	12.3	3.8	12.6
Percent on vegetation	0.25	0.21	0.003	0.50

SAMPLE—SOIL

	Top 4"	12"
Total lime (CaO)	1.05%	0.58%
as Calcium carbonate (CaCO ₃).....	1.87%	.....
Total magnesia (MgO).....	1.10%	0.51%
as Magnesium carbonate (MgCO ₃).....	2.35%	.....

(Testimony of F. E. Twining.)

Explanation of Analyses

1. The lime and magnesium are deposited as oxides, but gradually form carbonates when exposed to air.

2. It will be noted that amount of material on weeds was much less than on leaves due to fact that weed growth was new and had been exposed but a short time, while deposits on leaves extended over previous year and had not been washed off by winter rains.

3. The percent of lime and magnesia shows that the encrustations were dolomitic material.

Analysis of deposits on apricot leaves taken late in the fall of 1942 and 1943 shows considerable amounts of dolomitic material present.

Many fruit growers in the vicinity of lime and dolomite quarries and calcining plants, also Portland Cement mills, have noticed that the dust produced more or less serious damage to crops, especially deciduous fruits. There was a decrease in both amount and quality of fruit on the trees within the dust zone.

The following remarks are based on experimental work done by ourselves over a period of many years.

Appearance of Foliage

The foliage of plants in the dust zone show deposits of a fine, grey, gritty material. The thickness of the coating varies with the distance from the source and is usually perceptible for a distance of two miles from the source.

(Testimony of F. E. Twining.)

Source

That the dust comes from the quarries and calcining plants (particularly the latter) is evident by the following:

1. Chemical composition which shows that same is lime and/or magnesium oxides with some carbonates and different from road dust.

2. It is found nowhere else except in the area about the mills.

3. Reaction of recently deposited material is alkaline.

A study of mills in operation shows two main sources of dust:

1. Crushing of raw and calcined materials.

2. Stacks of kilns where materials are calcined.

The stacks are undoubtedly the principal source of the dust on foliage because the strong draft in the kilns carry some of the fine, dry material out of the top of the stacks (quite apparent to the eye.)

The distance to which the dust is carried points to high kiln stacks and forced ejection. The prevailing winds have considerable to do with this effect.

Amount of Dust

The amount of dust deposited on soil and foliage varies with distance from plant, weather conditions, and (so far as foliage is concerned) the type of vegetation.

Samples of leaves taken from the apricot trees in the fall of the year 1942 showed rather heavy

(Testimony of F. E. Twining.)

deposits of the dust indicating approximately 1½ to 2 tons per acre.

Samples of foliage from same orchard taken in 1943 showed rather heavy deposits of dust. The crop was very much diminished from previous years.

Analyses of all these deposits show same to be dolomite which had been calcined, then partially carbonated by exposure.

Samples of soil showed over 4% of lime and magnesium carbonates, in first 4 to 6 inches with decreased amounts in deeper layers.

Damage

A large amount of experimental work and numerous investigations in the field have been made on the effect of different dusts on various crops. The following are some of the facts determined:

Heavy deposits of ordinary road dust will cause trees to yield less fruit than when same are free from such dust.

Dusts, containing calcined lime and/or magnesia, which includes dolomitic material, Portland cement, quicklime, etc., differ from other dusts in that by absorbing dew or moisture in the atmosphere they form on the leaf surface a more or less hard encrustation that is not easily removed by rain, and may be difficult to remove by hand. The amount of this coating is usually less on annual crops or plants that shed leaves annually. However, there is always less fruit on the dusted side of trees.

(Testimony of F. E. Twining.)

During the past 8 to 10 years we have had occasion to determine the principal cause of injury to fruit trees by dusting same with above-mentioned materials at various times, and it has been found that damage is due to affect of soluble lime and magnesia on the blossoms.

In all cases where the material had been calcined and contained some soluble lime and/or magnesia present there was a decided injury to the fruit blossoms.

Only a small percentage of the blossoms so treated with such dust set fruit. (The unburned lime and dolomite—neutral carbonates—produced but little effect.

For some time after the falling of the petals no difference could be observed between blossoms so treated and those untreated. Both grew at the same rate. Often it was 10 to 15 days after blooming that any difference was noticeable. The unfertilized fruit stopped growing and soon dropped.

It has been shown definitely that the water soluble lime is the main substance affecting the stigma or the stigmatic secretions in such a way as to interfere with fertilization and thus permit setting of the fruit (Magnesia produces the same effect.)

THE TWINING LABORATORIES

By F. E. TWINING

FET/ep

[Endorsed]: Filed 9/13/44.

(Testimony of F. E. Twining.)

Mr. Naus: I at this time offer in evidence Plaintiffs' Exhibit 5 for Identification.

The Court: It may be admitted and marked.

(The document referred to was received in evidence and marked Plaintiffs' Exhibit 5.)

PLAINTIFFS' EXHIBIT No. 5

[The Twining Laboratories Letterhead]

August 8, 1944

Mr. J. T. Harrington
National Bank Building
Salinas, California

Dear Sir:

We enclose a copy of findings in the last two trips to Pista Orchard, and would say that it is quite evident that either some method of reducing the dust, or considerable less operating has occurred at the Permanente Plant this season.

The deposits on the oak leaves taken on March 14, 1944, and on apricot leaves taken in the fall of 1943 and 1942, show heavy deposits which would indicate decided damage both to setting of crop and to the appearance of the fruit at harvest.

This year (1944) while there was dolomite present on the blossoms and leaves, in March, it was so little that no great damage would occur although undoubtedly there was some.

At harvest there could be seen on the fruit and leaves some deposit, but on the fruit it would not appear to the ordinary observer, although the coating on the fruit was slightly gritty. A careful ex-

(Testimony of F. E. Twining.)

amination by a proposed purchaser would probably result in a loss of sale or if same was made, at a reduced price.

It is going to be rather difficult to assess damages for this season as the crop is large and in fairly good shape. However, we do know that damage has occurred in the past both by reducing amount of the crop and appearance of it.

Your very truly,

THE TWINING LABORATORIES

By F. E. TWINING

fet/lp

Examination

B53482

Supplementary report on Pista Orchard, East of Salinas near Calcining plant and quarries of Permanente Co.

Inspections were made and samples of leaves and apricots were taken on June 22 and August 1, 1944. Results show very decidedly that there was deposited on the foliage and fruit of this orchard much less material than in the years 1942 and 1943.

Our analyses of leaves made December 12, 1942, and later on leaves taken during 1943, and on oak leaves early in 1944 show very heavy deposits of dolomite.

The figures for deposits on apricots and apricot

(Testimony of F. E. Twining.)

leaves on July 22, 1944, and on apricots (during picking) and leaves on August 1, 1944 are attached.

THE TWINING LABORATORIES

By F. E. TWINING

fet/lp

Sample—Dolomite

Taken below quarry by F. W. Twining, on August 1, 1944.

Silica (SiO_2)	0.05%
Iron and Alumina (R_2O_3)	0.18%
Calcium Carbonate (CaCO_3)	56.34%
Magnesium Carbonate (MgCO_3)	43.40%

This is a high grade ore and probably better than the average.

THE TWINING LABORATORIES

By F. E. TWINING

hgr/lp

Sample—Branches from apricot trees, taken by F. W. Twining and D. S. Piston, 6-22-44.

	Apricots (15)	Leaves (30)
Total weight of sample taken.....	480 grams	17 grams
Surface area of sample taken.....	57.5 sq. in.	123.2 sq. in.
Weight of total deposit.....	29.7 mg.	86.8 mg.
Percent of total deposit on sample.....	0.0062%	.5105%
Weight of total deposit per sq. in.....	0.791 mg.	0.705 mg.
Weight of silica (SiO_2) per sample....	2.7 mg.	7.7 mg.
Percent SiO_2 in total deposit.....	9.09%	8.87%
Weight of iron & Alumina (R_2O_3)		
per sample	0.6 mg.	1.7 mg.
Percent in R_2O_3 in total deposit.....	2.02%	1.96%
Weight of Calcium Carbonate (CaCO_3)		
per sample	13.9 mg.	42.1 mg.
Percent CaCO_3 in total deposit.....	46.80%	48.50%
Weight of Magnesium Carbonate		
(MgCO_3) per sample	11.1 mg.	31.2 mg.
Percent MgCO_3 in total deposit.....	37.38%	35.94%

F.E.T.

(Testimony of F. E. Twining.)

Sample—Branches from apricot trees, taken by F. W. Twining, on August 1, 1944.

	Apricots (21)	Leaves (89)
Total weight of sample taken	1000 grams	50 grams
Surface area of sample taken.....	37.5 sq. in.	123.2 sq. in.
Weight of total deposit	223.5 mg.	398.4 mg.
Percent of total deposit on sample.....	0.0224%	0.7968%
Weight of total deposit per sq. in.....	1.188 mg.	1.186 mg.
Weight of Silica (SiO_2) per sample....	32.7 mg.	55.9 mg.
Percent of SiO_2 in total deposit.....	14.61%	14.03%
Weight of Iron and Alumina (R_2O_3) per sample	12.9 mg.	21.7 mg.
Percent of R_2O_3 in total deposit.....	5.76%	5.44%
Weight of Calcium Carbonate (CaCO_3) per sample	96.6 mg.	182.0 mg.
Percent of CaCO_3 in total deposit....	43.23%	45.68%
Weight of Magnesium Carbonate (MgCO_3) per sample	70.7 mg.	121.3 mg.
Percent of MgCO_3 in total deposit	31.64%	30.45%

F.E.T.

[Endorsed]: Filed 9-13-44.

Mr. Moore: We reserve the objection, your Honor, to any conclusions that the witness stated there. We do not accept those as evidence.

Mr. Naus: I take it what is meant by that is they are open to weighing by your Honor in light of the cross-examination and in light of contradictory evidence and opinions, if there are any; that is definitely understood, of course.

Q. Mr. Twining, in this Plaintiffs' Exhibit 4, the report was prepared and signed by you personally, was it? A. Yes.

Q. The statements of fact or opinion or con-

(Testimony of F. E. Twining.)

clusions or theory [96] or anything in there are your statements? A. Yes.

Q. That is equally true as to Exhibit 5, the supplementary report, is that correct? A. Yes.

Q. And in each of those exhibits Nos. 4 and 5 those opinions, statements, conclusions, theories and the like are re-stated by you now under oath on the stand, are they?

A. They are statements made by me from data which I had and based on information of work done in the past.

Q. I do not think you quite followed me. At the time you made these originally they were simply unsworn statements in writing by you to Mr. Pista or to Mr. Pista's attorney. I am asking you now whether you are prepared to repeat the same statements here in court as being true, to the best of your belief. A. Absolutely.

Mr. Moore: I just want to make one objection, Mr. Naus.

Mr. Naus: Yes, only one.

Mr. Moore: So the record may show that we are not bound by his conclusions in regard to matters in which he is not qualified.

Mr. Naus: I will join in that, Mr. Moore, because I know that his Honor already knows that and would look at it in that light.

Q. Now, Twining, is there anywhere in that entire area or neighborhood down there that the dolomite or dolomitic deposit that you found on the

(Testimony of F. E. Twining.)

vegetation and fruit in the Pista orchard could come from except the Permanente plant?

A. Not that I know of. [97]

Q. You have been through that neighborhood and looked it over, haven't you?

A. Over many years, yes.

Q. Is there any other source whatever that it could have come from that you know of?

A. No, that is the only calcine plant in the district that I know of.

Q. Are you satisfied that is where it came from?

A. Yes.

Q. Did you make any tests or experiments with respect to the effect of the deposit of such dust on the leaves, blossoms, and the like of the apricot orchard, with respect to the effect that it would have?

A. I knew the effect of deposits of that kind from experiments made over a period of ten years.

Q. State the effect of such deposit of such dust on the leaves, blossoms, fruit and the like, the vegetation, in an apricot orchard.

Mr. Moore: I am going to object to that as too general—leaves and everything else. I think it ought to be precise. I think the question is highly indefinite, your Honor. The minute you go into botany and into the study of plant life you get a wide variation, and I think Mr. Naus' question is too general.

Mr. Naus: Well, it is the deposit of the dust by the defendant that pushes this farmer into botany,

(Testimony of F. E. Twining.)

and I could only ask the question that would be called for by the issues in this case. Here we have established that dolomite dust, or whatever [98] you call it, comes from that plant and comes in the orchard. Having gotten in the orchard, I want somebody competent to state what effect it has. I can't ask everything in one question.

Mr. Moore: I know you can't ask everything in one question, but you can cut your questions to pieces so you ask one question at a time. In other words, this gentleman is an expert, your Honor.

We are put in a very peculiar position here in determining whether it is a question of interference with pollinization, whether it is the growth of the tree, photosynthesis, or what it is, and here is a man who is an expert, and I think that he should be held down to definite questions on his direct examination, not what this particular dust does on general things, but what it does in this particular instance, what the dust is composed of, and all the chemical reactions, and I make the objection the question is entirely too general.

Mr. Naus: If the Court please, I have already separately established what your Honor has not had an opportunity to see, exactly what that dust is composed of in the finest mathematical quantities, by the various chemical names and the like. I have fully identified the dust and where it comes from. I am merely asking this witness here to tell what happens in an apricot orchard to apricot trees when such dust falls on the trees, what is the effect of it.

(Testimony of F. E. Twining.)

The Court: Is that your question? [99]

Mr. Naus: That is my question.

The Court: He may answer that question.

A. The effect of that dust can be in at least two forms. If a calcine material is deposited in the blossoms during the blossoming period—of course, this dust is alkakine—it affects the secretion of the stigma and prevents the pollinization or fertilization. That occurs during blossoming time and, of course, depends on the quantity as to how much damage it might do.

The other damage it can do is the amount of deposit on the fruit and the appearance of the fruit. Also, the deposit on the leaves, if heavy enough, and interference with photosynthesis may cause trouble to the tree eventually.

Mr. Naus: Q. You spoke of calcine material. In these exhibits and in the chemical analyses that appear in them, does calcine material appear?

A. Well, of course, a calcine dolomite is a magnesium and calcium oxide.

Q. Is that present in these oxides?

A. Oh, yes.

Q. Take this dolomite ore on the Permanente ground there. It is quarried out, surfaced quarried, is it not?

A. Yes, that is, in the form of a carbonate.

Q. Whether it is quarried in that quarry in the first instance, it is not yet calcium, is it?

A. No, it is not calcium.

(Testimony of F. E. Twining.)

Q. There is a plant on the Permanente property in which the calcine occurs, does it?

A. There is a calcine kiln there on [100] the property.

Q. Is that the plant that has those tall high stacks connected with it? A. That is right.

Mr. Moore: Pardon me, Mr. Naus, may I make a suggestion? It might assist your Honor to understand this thing if I made a brief statement at this time so that your Honor will fully appreciate this matter. Dolomite, as I understand it, is a deposit of calcium carbonate—we expect to prove this—and magnesium carbonate. This mine, if you call it that, or quarry is located outside of Salinas. The first step in this process is putting it in a kiln, there, that is similar to, you might say, a cement kiln. Cement is calcium carbonate primarily. Dolomite has magnesium and is about a fifty-fifty percentage of magnesium carbonate and calcium carbonate. It is put through practically the same process that it is put through in cement kilns. You correct me, Mr. Twining, if I am in error.

The Witness: That is right.

Mr. Naus: Just a minute, Mr. Moore. Please, now. Don't give any direction like that to the witness. I want to interrupt right there.

Mr. Moore: May I withdraw it?

Mr. Naus: No. I merely wish to make a statement as you are making. I will have no objection to your making a statement at this time that will assist his Honor in any way. In so far [101] as

(Testimony of F. E. Twining.)

they are statements of fact, I will expect them to be proved through witnesses on the stand. Now, when I have a witness on the stand and you ask him to listen to you and correct you as you go along, you are in effect seeking to have the witness give a sort of approval or disapproval to what you say. I would rather the witness be silent during this statement, but I will make no objection to the statement if it will assist your Honor.

Mr. Moore: I will withdraw that. I did not intend to do that, your Honor. In the light of Mr. Naus' objection, I will apologize. In the next step it is taken over to Moss Landing and there sea water, which has magnesium also in it, and chloride—this magnesium oxide is mixed there with magnesium chloride, and the magnesium oxide is finally taken to the Permanente plant at Saratoga, where it is finally made into magnesium metal. This is one continuous process. The dolomite is mined at Salinas and there put in a kiln similar to a cement kiln. The dust that is now involved in this matter comes from this kiln.

Mr. Naus: Q. Let me ask whether the samples of vegetation, leaves and the like upon which this dust fell in 1943, when compared with the samples that you took upon which dust fell in 1944, showed any difference with respect to volume or quantity of the deposit of dust?

Mr. Moore: I am going to object to the question. I do not recollect any samples taken in 1943. What were they? [102]

(Testimony of F. E. Twining.)

Mr. Naus: If your Honor please, there is evidence about them.

Mr. Moore: May we have them introduced in evidence or in some way identified?

The Court: Are these samples in 1943?

The Witness: I did not take samples. I had some samples taken.

Mr. Naus: The witness has testified two or three times, if the Court please, the only personal samples taken by him were in 1944, but that independently of the samples taken by him, he analyzed samples taken by the Pistas and sent to him for examination, samples taken in 1943 and, in fact, some in 1942. That is all in the case. Now, I am asking him simply upon a comparison of those samples what his analysis and examination of them shows with respect to the volume of dust deposited on vegetation in 1943 as compared to the volume deposited in 1944.

The Court: He may answer if he knows, and then you may develop it on cross-examination.

A. Yes, the deposits were heavier in 1943 than they were in 1944. I might simplify that a little by an explanation.

Mr. Naus: Q. Very well.

A. You see, the foliage given me that was taken in 1943—it was sent to me——

Q. Yes.

A. The foliage I took in March of 1944 were three of the samples taken from foliage that had lasted over the year. [103] over the winter, and one

(Testimony of F. E. Twining.)

was taken from weeds that had an early growth. Of course, that was early in the season and the deposit would be very light, and it was followed up by subsequent visits over there.

Q. What were these samples that you speak of, samples of the foliage carried over from a previous year? Describe them.

A. There were some oak leaves and citrus leaves taken at various places on the property.

Q. Were you able from such samples, those carry-over leaves, to compare the deposit of one year with another?

A. The deposit we obtained in March thereon the foliage—

Mr. Moore: Pardon me just a moment. I do not like to interrupt—you say March; do you mean 1944?

The Witness: Yes.

Mr. Naus: Q. That is the same March 14, 1944 that you have mentioned about a half a dozen times, Mr. Twining?

A. Yes. That is the one I took samples of in order to get an idea how much material had been deposited since the previous time I took foliage that had carried over from the year before. The foliage at the time—there were practically no leaves on the apricot trees, and we took samples off a pretty good growth of weeds along the little stream running through the orchard.

Q. You mean weeds carried over from the previous year?

(Testimony of F. E. Twining.)

A. No, they were new. That was new growth.

Q. New weeds. I wanted to clear that up. Now, in making that [104] comparison of 1943 with 1944, will you tell me what that comparison showed with respect to extent or volume of deposit?

A. Well, the volume of deposit on those leaves was heavy. On the weeds it was very light.

Q. When you say heavy on the leaves, do you mean the carry-over leaves from the year before?

A. Yes.

Q. When you say light on the leaves, do you mean the new vegetation of 1944? A. Yes.

Q. When you compare heavy with light, they are sort of general terms; can you give us an approximation as to how many times heavier or something of that sort?

A. I might give you some figures here.

Q. All right, make the comparison of the two years now.

A. The percent on the vegetation, that is, the total deposit—

Q. Dolomite?

Mr. Moore: Wait a minute: Please don't lead him, Mr. Naus.

Mr. Naus: I am not interested in percent of deposit of anything. There may have been seagulls in the neighborhood. I am not interested in that. I am only interested in dolomite.

Mr. Moore: May I voice an objection, your Honor? We are talking about the deposit on the figs or the trees, or what have you.

(Testimony of F. E. Twining.)

The Court: His sample has to do with new growth and oak leaves that he took samples of there, and that goes to the weight of the testimony.

Mr. Naus: I am only seeking to compare one year with another.

Mr. Moore: I understand that, but what I objected to was Mr. Naus interposing the word "dolomite."

Mr. Naus: I just wanted to tell him that it was dolomite only that we were interested in.

Mr. Moore: That is what we object to. It was not dolomite at that time. I think Mr. Twining would agree with me. The only thing I objected to was Mr. Naus' interjection.

The Witness: I explained that by giving the variations on the vegetation. For instance, on the oak leaves, on a small sample taken at one place, we had 3.89 percent by weight on the vegetation.

The Court: Q. What was that?

A. That was dolomitic material. We have an analysis of it, so I could tell.

Mr. Moore: May I interrupt a moment and ask a question?

Q. Mr. Twining, you are looking at certain figures there. May I ask what they are?

A. These figures—that was the total percent of the deposit. Now, I could give you the amount of the magnesium and the amount of the calcium oxide.

The Court: He wants to know what you are reading from.

(Testimony of F. E. Twining.)

The Witness: This is page 3 of the General Report.

Mr. Naus: I think, Mr. Moore, the witness is only referring to his own carbon copy of the exhibits. That is all he has.

Mr. Moore: That is all I want to know [106]

The Witness: Now, on the citrus leaves we got 1.71 per cent. On the weeds along the creek we got .09, that is, nine-hundredths of one per cent. On the oak twigs and leaves and other samples taken from another tree we get 4 per cent. [106-a]

Mr. Naus: Q. Take the quantities of this dolomitic material, or whatever one should call it, that your analyses showed deposited in the year 1943, what if any effect would that, or such a deposit have on the pollinization in the apricot orchard?

Mr. Moore: Wait a minute. I am going to object to that, as this witness is not properly qualified as an expert.

Mr. Naus: I submit he is, if the Court please. There is no suggestion in the objection of any element that could be cured. He just waves his hand generally and says, "I don't think he is qualified." It does not sound like an objection to me.

Mr. Moore: I will raise the objection that I do not think he is qualified as an expert on horticulture and botany. He is an expert chemist, as I understand it.

The Court: You can interrogate him if there is any question about it, and lay the foundation.

(Testimony of F. E. Twining.)

Mr. Moore: Q. Mr. Twining, what experience have you had in the matter of horticulture and botany?

A. Well, for a period of over forty years I have been in the Fresno district and handled—I would say 50 to 60 per cent of our work is agriculture.

Q. In the matter of pollinization have you had occasion to study that?

A. Yes. We did a number of experiments and made a number of examinations of the effect, primarily I would [107] say, of cement dust. However, on alkaline dusts on the blossom. In other words, we have an acid secretion on the stigma of the blossom which may be neutralized, depending on the quantity of an alkaline material deposited there.

Mr. Moore: I will withdraw any objection, if your Honor please.

Mr. Naus: Mr. Reporter, will you read the pending question.

(Question read as follows: “Q. Take the quantities of this dolomitic material, or whatever one should call it, that your analyses showed deposited in the year 1943, what if any effect would that or such a deposit have on the pollinization in the apricot orchard?”)

A. I would state that any alkaline material, calcine dolomite or calcine lime will affect if it is deposited during the blossoming time.

(Testimony of F. E. Twining.)

Mr. Naus: Q. Explain to his Honor how that occurs and why that is so.

A. I simply repeat the statement that there is a sort of an acid secretion on the stigma of the blossom that is in the pistil, and this material will neutralize that and prevent fertilization. It is a question of quantity.

Mr. Moore: Pardon me. What was that last part?

The Witness: I say it is a question of quantity. It depends on the amount of material that is deposited on the stigma.

Mr. Naus: Q. The prevention of fertilization, I take it, [108] prevents the setting of fruit or the production of fruit, is that correct?

A. That is right.

Q. Assuming, Mr. Twining, the deposit of the dolomitic material in 1943 to the extent that your examination and analyses of the 1943 samples disclosed, and assuming that those samples came from the Pista orchard of 44 acres, or something like 3000 trees or over, and assuming that in the year 1943 that orchard and those trees produced no more than 27 tons of apricots, what in your opinion or estimate would the tonnage have been if that dolomitic deposit had not fallen upon the trees?

Mr. Moore: I will object to that as incompetent, irrelevant and immaterial, and also this witness is not qualified as an expert horticulture or agriculture student, and the hypothetical question asked him does not embrace all the facts as dis-

(Testimony of F. E. Twining.)

closed by Mr. Lewis as to what actually happened in that year. As I understand it, your Honor, a hypothetical question asked an expert witness, asking for his opinion, has to include every fact that has been disclosed in the evidence, and I do not think that Mr. Lewis' testimony is included here at all with regard to the cold and foggy weather and the three cycles of blossoming. I think the question is highly improper.

Mr. Naus: If the Court please, after all these years this is the first I have heard that a hypothetical question has to embrace every fact that has been mentioned in the case. I [109] understand the rule to be that such things that I do assume must have some basis in the record. My assumptions have that basis.

The Court: His question assumes these facts that he has related. That may not be all of them.

Mr. Moore: He has to assume, as I understand the law, your Honor—a hypothetical question asked an expert witness has to include substantially all the facts that have to do with the particular question. In other words, it is highly erroneous if it only includes one or two facts. It has to be all-inclusive. I do not mean every detail, but every substantial fact.

The Court: Now, let us follow that out. If it is a fact that on cross-examination the failure or the weakness of what he has failed to do, you can develop?

(Testimony of F. E. Twining.)

Mr. Moore: That may be true, but on direct examination with an expert witness—I am not talking about a witness who is testifying as to facts of his own knowledge, known observation—but a witness who is asked a hypothetical question—and I know your Honor has seen them, and I know I have seen them where I have spent days almost preparing a hypothetical question that may cover ten or fifteen pages of typewritten matter, to be sure that I have it all-inclusive. Now Mr. Naus asks a question here that does not include anything.

The Court: Let the reporter read the question so we will have a better understanding of it. [110]

(Question read.)

The Court: I am going to allow the question subject to your motion to strike.

(To the witness:) Can you answer that question?

The Witness: Just in a general way.

Mr. Naus: Very well; proceed.

Mr. Moore: After that answer I again raise the same objection, your Honor.

The Court: Same ruling.

Mr. Naus: Proceed with your answer, Mr. Twining.

A. There was definite damage due to the deposits. Now, in order to arrive at how much damage occurred, I either would have had to have examined that orchard through the season, or, taking into consideration general conditions, 1943 was what we call a low-crop year, and average it

(Testimony of F. E. Twining.)

up. For instance, the average in our particular territory would run from 35 to 50 per cent of a crop. Under those circumstances, why, of course, 27 tons was practically nothing.

Q. All right. How many——

Mr. Moore: Just a moment, please.

Mr. Naus: I thought he had finished. Do you wish to make an objection?

Mr. Moore: I want to make a motion to strike the answer out, your Honor, on the same grounds I voiced in the original objection. [111]

The Court: I will allow the record to stand. Let your objection be noted, and the answer stands subject to your motion to strike.

Mr. Naus: Q. I did not realize—had you or not finished, Mr. Twining? There was an interruption here.

A. I guess that is sufficient.

Q. Can you from the question I put to you indicate to me an opinion or estimate, say, in the form of how many times 27 tons might have been expected if there had been no dust?

Mr. Moore: I am going to voice the same objection and add to it this man is not qualified, is not a horticulturist, and how in the world can anybody even make a guess, your Honor?

The Court: I do not know, but I will have a record and you will have a record to comfort yourself with. I will allow it to go in under the same ruling.

(Testimony of F. E. Twining.)

Mr. Naus: May we have the answer, Mr. Twining?

A. My answer would be simply an estimate.

Q. That is all I am asking for.

A. Based on the conditions.

Mr. Moore: May it be understood my objection goes to this?

The Court: Let the record so show.

A. His crop could have been anywhere from 7, 8 or 9 times what it was.

Mr. Naus: Q. You mean times 27 tons?

A. Correct.

Q. State the reason or reasons for your estimate of 7, 8 or 9 times 27 tons.

A. Well, I am basing that simply on general [112] conditions that I knew occurred; that is all.

Q. In the year 1944, as I understand it, you have testified to three occasions beginning in March, I believe, on March 14, 1944—three occasions during the year on which you visited the orchard?

A. Correct.

Q. Was that occasion on March 14 in blossom time, or before or after blossom time?

A. It was during blsosomal time.

Q. What did you observe on that occasion during blossom time and what did you learn from your estimate of the amount of dolomitic material then being deposited on the orchard with respect to the effect, if any, upon pollinization in 1944?

A. It could not be determined at that particular time. The amount of material deposited was ex-

(Testimony of F. E. Twining.)

ceedingly small, and it was too early to see the setting of the fruit.

Q. Then on the subsequent occasion did you examine further with respect to the deposit of dolomitic material and its effect, if any, upon the setting of the fruit in the year 1944? A. Yes.

Q. What did you find?

A. Well, I found that the deposit was very light and it had not affected the fruit to amount to anything.

Mr. Naus: You may cross-examine.

Cross-Examination

Mr. Moore: Q. You say that the deposit was very light in 1944 and had not affected the fruit?

A. I didn't say, I [113] wouldn't say that it had not affected the fruit any, but it was exceedingly small.

Q. Would you say it had or had not affected the fruit in 1944?

A. No, I wouldn't say either way. I would say if there was a light amount being deposited, there was a chance it might have affected the fruit. It was so small it did not.

Q. From your observation did it affect the fruit in 1944?

A. I understand they had a very good crop, so apparently it did not.

Q. You appreciate as an expert I am asking your opinion. In your opinion did the dust that was deposited on that orchard in 1944 affect the yield in any way?

(Testimony of F. E. Twining.)

A. No, not to amount to anything.

Q. Well, not to amount to anything?

A. In any way—I wouldn't state that, that it did not affect it in any way, but I would state that there was not sufficient there to affect it materially.

Q. What do you mean by that?

A. I mean it might have prevented a few blossoms. A man would have to examine the tree very carefully to see whether there was any dropping of the fruit at all.

Q. Mr. Twining, may I explain something? The plaintiff in this action is not only asking for damages but is asking for an injunction to close down this plant, and therefore the question whether there was any injury in 1944 to the fruit is of vital [114] importance.

Mr. Naus: One moment, if the Court please. As long as counsel is giving a law lecture to the witness, I will go further and say that we are entitled to an injunction if it can be shown that any dust is being deposited on the orchard.

Mr. Moore: I am asking the witness as an expert: In your opinion was the deposit of dust in 1944—did that affect the crop, the yield of apricots on the Pista ranch in any way?

A. Well, I wouldn't say no or yes to that. I would say not materially. It certainly did not affect it very much.

Q. If it affected it at all, it would be very little, is that correct? A. That is right.

(Testimony of F. E. Twining.)

Q. You stated that dolomitic material was deposited on this ranch. Will you state, please, what you mean by dolomitic material?

A. Well, dolomite is a mixture of magnesium—dolomite itself is a mixture of magnesium and calcium carbonates with some impurities.

Q. Did you make any analysis of any of the raw dolomite there that is mined at Salinas?

A. Yes.

Q. Where is that analysis?

A. I have an analysis—I have made some in the past, and I couldn't connect them up, but this particular sample was taken at the plant.

Mr. Naus: Here it is, Mr. Moore, on your side of the table, one of the exhibits.

Mr. Moore: I have not had a chance to study it, Mr. Naus. [115]

The Witness: This was an extra good sample that was taken on August 1, 1944.

The Court: Q. Where was it taken?

A. It was taken below the quarry at the plant.

Q. The ore itself? A. Yes.

Mr. Moore: Q. And that contains, outside of silica, iron and alumina, calcium carbonate, that is, CaCO_3 ? A. CaCO_3 .

Q. 56.34 per cent, is that correct?

A. That is correct.

Q. And magnesium carbonate, which is MgCO_3 , 43.40 per cent? A. That is correct.

Q. In the ordinary manufacture of cement what is the basis of cement?

(Testimony of F. E. Twining.)

A. The basis of cement, of course, is calcium oxide, that is, it is calcium compounds.

Q. Is it calcium oxide or calcium carbonate?

A. They use calcium carbonate and make a slurry, which is then calcined, and we get calcium compounds, of which some of it is calcium oxide.

Q. Would you mind taking the blackboard for just a moment, Mr. Twining, here? When dolomite is mined, the deposit down there is almost 50-50 calcium carbonate and magnesium carbonate, or very close to that?

A. We ordinarily figure it that way.

Q. Would you mind writing down the chemical formula for dolomite on the blackboard?

A. The formula would be (writing on blackboard) " CaCO_3 ", " MgCO_3 ."

Q. When you apply heat to that, that is calcined, that is the [116] term you used a moment ago?

A. Calcined, yes. If it is actually dead burnt, we get CaCO , that is, calcium oxide plus CO_2 , that is, carbon dioxide.

Q. And you get magnesium oxide, MgO , and CO_2 ?

A. That is dead burnt. They very seldom burn it that much.

The Court: Q. Do they burn this in a furnace?

A. At a high temperature in a rotary kiln.

The Court: That is what I thought, but I didn't know.

(Testimony of F. E. Twining.)

Mr. Moore: I have some photographs, your Honor.

The Court: That is all right. I just wanted to know that.

Mr. Naus: I have not examined that. You mean of the operation?

Mr. Moore: Of the operation.

Mr. Naus: No, I have not examined it yet. I have no objection to your marking anything for identification and letting his Honor see it. You gave it to me during the trial, I said I would be glad to look at it during the noon hour, but I have not looked at it yet, because I had my mind on something else. But I have no objection to your marking something and letting his Honor see it. I do not know anything about it. My understanding is the Pistas or their men were refused admittance to the plant during the pendency of this case.

Mr. Moore: They were not refused admittance by anybody.

Mr. Naus: You can't state that. They were there; you [117] were not.

Mr. Moore: I do not like to get into any dispute about that, but nobody was refused admittance.

Mr. Naus: Ask Mr. Klein about that. He might be able to tell you something about it first hand.

(The photographs were marked Defendant's Exhibit A for Identification.)

Mr. Moore: I might say, your Honor, the first is the quarry up there, that is, Natividad, and these

(Testimony of F. E. Twining.)

are the kilns. The first three pictures are the kilns. It is like where they take a picture of somebody with their feet showing too big.

Mr. Naus: May that be withdrawn by me during the noon hour?

Mr. Moore: Oh, surely.

Mr. Naus: I am asking his Honor. I have to get his permission now.

Mr. Moore: Q. Out of the stacks that are there, Mr. Twining, what material comes out of the stacks of the rotary kilns?

A. Well, on a rotary kiln we have a very strong draft through the kiln. Now, the material goes in there and that draft very often carries some of this dust, but the material that comes out of the stack is principally carbon dioxide.

Q. Carbon dioxide, or carbon monoxide?

A. Well, there might be a trace of monoxide.

Q. When that comes in contact, is there any change in its chemical constituency as it passes up the stack? [118]

Mr. Naus: Contact with what? Objected to as vague.

Mr. Moore: I will withdraw the question.

Q. Is there any change as that comes from the rotary kiln and passes up the stack, so far as its chemical formula is concerned?

A. The material that passes up the stack are these gases, and the force of them carries some of the fine dust with it.

(Testimony of F. E. Twining.)

Q. There is quite a difference in monoxide, dioxide, and calcium carbonate?

A. That does not enter into this at all except to carry out this dust.

Q. What do you mean, it does not enter into it?

A. This goes into the atmosphere and does not have any effect on anything.

The Court: Q. You mean the gases?

A. The gases themselves.

Mr. Moore: I am talking about the dust.

The Witness: Well, the dust is some of your dolomitic material, not entirely calcine, but some calcine.

Mr. Moore: May I interrupt? Let us get away from "dolomitic material."

The Witness: The material that goes in this plant is ground up fine.

Mr. Naus: If the Court please, how can we get away from dolomitic material if it is going up the stack and coming out of it? [119]

Mr. Moore: Q. Will you give me the chemical formula not of dolomitic material, because that is CaCO_3 and MgCO_3 , but I am asking you what the dust is that goes out of the stack. What is the chemical formula?

A. The chemical formula might be a half dozen different formulas.

Q. Give them to me.

A. You have some of your original calcium carbonate and magnesium carbonate, and then you have some calcium——

(Testimony of F. E. Twining.)

Q. Pardon me for interrupting you. You say "carbonate." That is CO_3 .

Mr. Naus: One moment, if the Court please. I suggest that counsel discontinue interrupting the witness, interrupting answers and leaving them incomplete.

The Court: In the heat of the battle counsel sometimes do that. You will refrain, will you, counsel?

Mr. Moore: I will. I am going to ask the witness to use purely chemical terms—not carbonates, dioxides, or anything of that sort, or magnesium oxide, but I am going to ask him to use chemical formulas when he talks about dolomitic material.

Q. I am asking you, if you will, to use the chemical formula, and I ask you what dust goes up the stack.

A. I will tell you. Your ore goes in your kiln with a heavy blast, that is, a flame in which there is a blast of air. That flame goes through here. This is carbonate, and so on, coming [120] up here, calcined, and in here you have partial calcined material. Down here maybe you have completely calcined material. Now, that draft is pulling all these different things up the stack. That flue dust may be extremely variable, that is, the dust itself. Now, we have got in that calcium and magnesium carbonate.

Q. That is MgCO_3 and CaCO_3 , is that right?

A. We have got this (indicating).

Q. That is what I want.

(Testimony of F. E. Twining.)

A. And then we have got this, and then we have some transitions (indicating).

Q. Pardon me just a minute. So that the record may show it, by "this," Mr. Twining drew a circle around " CaCO_3 " and " MgCO_3 "; that is correct, isn't it?

A. We have a mixture of carbonates and oxides along with silica, alumina, and iron oxide, and maybe some other impurities might be present.

Q. Have you ever made a test to see what the dust was that came out of those stacks?

A. This stack, no, but I know what comes out of it.

Q. But you have never made an actual test?

A. Not of this stack, no.

Q. Take a cement mill. Have you ever made a test there? A. Yes, sir, lots of them.

Q. Which one?

A. Santa Cruz, Pacific Portland, the Tehachapi, Mount Diablo, Calaveras.

Q. What came out of the stack? [121]

Mr. Naus: Had he completed his answer? I don't know.

Mr. Moore: I thought he had. I am not interrupting you, am I, Mr. Twining?

Mr. Naus: You keep doing it.

Mr. Moore: He has pretty nearly covered all the cement plants in the West.

Q. Now, did you make a test of what came out of the stacks?

(Testimony of F. E. Twining.)

A. I made tests of the dust that came out of the stack.

Q. I mean at the stack?

A. I made examinations of the dust, which was the product at the bottom of the stack. I have made examinations of the gases that came out.

Q. Let me ask you a question: In your opinion, at this plant there at Natividad the dust that comes out at the top of that stack—what is its chemical composition?

A. Well, you have got a mixture of oxide and carbonates.

Q. Can you write down in your opinion as an expert your formula of what you think comes out of the top of that stack?

A. It is a mixture of this (indicating on black-board). It is a mixture of that. It has some Fe, ferrous oxide, plus two or three oxides—it has some aluminum oxide, silica——

Q. You wrote down there—May I ask this—this is Fe. What is that?

A. Ferrous oxide, aluminum oxide, this is silicon oxide.

The Court: I have a number of other matters to take up. We will take an adjournment until two.

(Thereupon a recess was taken until 2:00 p. m. this date.) [122]

Wednesday, September 13, 1944

2:00 P. M.

F. E. TWINING

resumed.

Cross-Examination—(Continued)

Mr. Naus: If the Court please, pursuant to permission at adjournment, I took with me during the noon hour this Exhibit A for identification so that I could examine it. After examining it I see no objection to its being admitted, if it is desired to put it in.

Mr. Moore: Thank you very much.

Mr. Naus: Could you tell me, Mr. Moore—I can't tell from the document itself—the approximate date it was prepared? I don't know what date it is speaking of. Do you know?

Mr. McCarthy: No. I will tell you before you are through.

Mr. Moore: May I make this statement, Mr. Naus: It is, I think, what they call a flow sheet. Is that the usual term?

Mr. Naus: I can see what it is, Mr. Moore.

Mr. Moore: It is a flow sheet of the entire process known as the carbothermic process of making magnesia.

Mr. Naus: If the Court please, I know exactly what it is. I have examined it. I make no objection to its being received. I merely make the simple inquiry, if it can be answered—if not, we will pass it—as to the approximate date it was prepared.

(Defendant's Exhibit A for Identification was received in [123] evidence.)

(Testimony of F. E. Twining.)

Mr. Moore: Q. I believe at the recess, Mr. Twining, we were discussing the character of the dust that came out of the stack. A. Yes.

Q. And I believe you said that it consisted of calcium oxide and magnesium oxide and carbon dioxide with some—what do you call it?

A. Well, it has the other constituents in magnesite in small quantities; a very fine dust that is blown through the kiln into the stack.

Q. And that comes out of the stack?

A. Well, a lot of it stays in the stack.

Q. Well, did you ever make any chemical analysis of that particular dust as it is in the stack or leaves the stack, or anything of that sort, other than the analysis that may have come from what you saw on the ranch itself?

A. You mean in this particular case?

Q. Yes.

A. No, I haven't examined the flue dust in this plant. I have examined simply the dust on the plants at the Pista orchard.

Q. In other words, your analysis of the dust will be confined solely to what you found on the Pista ranch, not what came out of the stack in this particular case. Mr. Naus made some suggestion that you were denied entrance. You were never denied entrance into that plant, were you?

A. Well, I might explain that. They wanted to get just a sample of the ore to determine [124] there the relative proportion of calcium and magnesium carbonates. And the foreman at the plant

(Testimony of F. E. Twining.)

did not feel that he should grant permission. It didn't come—I don't think it came from the city office. I am perfectly satisfied I could have got permission to go in any part of the plant, so far as that is concerned.

Q. In other words, the man in charge didn't feel that it was within his authority to grant?

A. No. I can see his point. It was perfectly OK.

Q. Did you take any of the material from around the plant or from the quarry? A. Yes.

Q. You took some material, so-called dolomite, from the quarry, did you not?

A. Some that dropped off the trucks.

Q. Off the trucks?

A. I imagine so. It was——

Q. Did you take any material from the plant itself after it had been calcined or anything of that sort? A. Not the plant itself.

Q. In other words, your knowledge of this is as you took the raw material from the trucks from where it had been quarried, and as it landed on the Pista orchard; am I correct?

A. This particular sample was to not go out to see just what the ore was; I have already examined ore from that particular quarry in the past, and in fact I have done more or less work for the Permanente Company.

Q. What I mean is this: that in the plant itself or immediately [125] when the dust left the plant,

(Testimony of F. E. Twining.)

you made no chemical analysis or samples of that particular dust? A. No, no.

Q. In other words, the two that you have taken have been at the quarry and on the Pista ranch?

A. Just simply a sample of the raw dolomite and the deposited material on these plants.

Q. I believe in your analysis you show that the dolomite consists of calcium carbonate to the extent of about 56 per cent or a little over?

A. In that sample, yes.

Q. And magnesium carbonate to the extent of 43 per cent, or a total, roughly of pretty close to 100 per cent? A. That's right.

Q. Now, will you look at your notes and tell us what the percentage was of the dust that you found on the Pista orchard—I mean the percentage of calcium and magnesium oxide or carbonate, or whatever it might be—your analysis of that dust that you found on that orchard?

A. The orchard at what time?

Q. Well, let's see. When did you take your first sample there?

A. The first sample on the orchard was taken on March 14.

Q. That is 1944?

A. Right. That is the first sample that I took.

Q. You took none in '43? A. No.

Q. Were there samples sent to you in '43?

A. Yes; that is, samples sent to me in '44 that were taken in '43.

(Testimony of F. E. Twining.)

Q. That is embodied in page 4 of Exhibit 5, is it not?

A. The samples sent me of the foliage, you mean—those leaves?

Q. Yes. A. No. [126]

Q. What page it is?

A. The analyses of that are not in this report.

Q. Have you an analysis of it?

A. I think that we have some analyses of it, but they are not made as complete, because we did not take the samples ourselves; we just simply—

Q. What analysis have you?

A. I have analyses of all the materials that we took.

Q. No; but have you an analysis of those that were taken—samples that were taken in '43?

A. That was simply to determine as to whether it was dolomite or not, and we didn't make quite as elaborate a test as shown in these tables. I might state that this material on Exhibit 4, page 3, with the exception of sample No. 3, was practically all '43.

Q. Let me ask you, so I can try to get this thing clear: Of the soil or leaves or dolomite or whatever it might be, what was the first analysis that you made? I mean, when did this thing first come to your attention?

A. It first came to my attention in December of 1942.

Q. December of 1942? A. Yes.

(Testimony of F. E. Twining.)

Q. In what way did that come to your attention?

A. Sample of leaves were mailed us to determine what that white deposit was on them.

Q. Who mailed that?

A. I think a fellow by the name of McDonald mailed them.

Q. Have you his communication?

A. I have just a letter. [127]

Q. May I see it?

A. A copy of a letter (handing paper to counsel).

Mr. Naus: May I glance at it, Mr. Moore?

Mr. Moore: Oh, surely.

Mr. Naus: Go right ahead. Don't let me stop you.

Mr. Moore: I thought you had seen it.

Mr. Naus: No, I haven't seen it.

Mr. Moore: Q. Mr. Twining, you have handed me a copy of a letter apparently addressed by your organization to Mr. McDonald at Watsonville, but in that letter you refer to a letter of December 10 from Mr. McDonald. Will you look at your file and see if you can discover the letter of December 10.

A. Well, that was his letter relative to—I don't happen to have a copy with me, but the letter referred to some other analyses we made for him on other substances, and then he also called attention to the fact that he was mailing these leaves from the Pista orchard. Now, this is an answer that we made to him.

(Testimony of F. E. Twining.)

The Court: Q. Where is the original letter, if you have it?

A. The original letter is probably in our files.

Mr. Moore: Q. Who is Mr. McDonald, do you know?

A. He is a fertilizer dealer in Watsonville.

Q. What did he send you in connection with the letter of December 10, 1942?

A. We handle a great deal of work for Mr. McDonald, soils, fertilizers, and things of that sort.

Q. Well, I mean——

A. Of course, one thing that he referred to was these leaves that he was sending. And in this letter we speak of something on some olive pulp that he sent. There was an examination made for its fertilizer value. And then we also speak of the deposit on the leaves.

Q. Did you make an analysis of the deposit on the leaves that Mr. McDonald sent you?

A. Yes.

Q. Have you that analysis? A. No.

Q. Well, didn't you keep a copy of it?

A. There is probably a copy in our files, but at the time I didn't think it would ever enter this case at all.

Q. Maybe I am in error, but were these leaves that were sent by Mr. Pista or from the Pista ranch?

A. The leaves that Mr. Pista sent to us were later. He sent those himself direct.

Q. Well, what I am trying to find out is, you

(Testimony of F. E. Twining.)

have referred to December 1942 and that Mr. McDonald sent you certain samples and leaves and one thing and another. Were they from the Pista ranch? A. That is what he said.

Q. Have you that analysis?

A. It would be probably in our files.

Q. But you haven't it here in court?

A. I haven't it with me.

Q. That was the first time that this Pista dust was called to your attention, is that correct?

A. The leaves were sent to determine what was on them, that is all.

Q. And you haven't that analysis with you?

A. No. [129]

Q. Now, when was the next time?

A. The next time was the samples that I took myself on the 14th of March.

Q. That is '44? A. '44, yes.

Q. So the first time that you had any direct connection with the Pista ranch was in March of 1944, is that correct?

A. Personal connection, yes.

Q. And did you visit the Pista ranch on that occasion? A. Yes.

Q. And did you take the leaves off?

A. Yes. Well, the leaves—the leaves I took were oak leaves and citrus leaves. The apricot leaves were not very far advanced—the buds, and so on.

Q. Well, how advanced were they?

(Testimony of F. E. Twining.)

A. Well, there wasn't enough foliage there for me to determine. And another thing, they had been sprayed with a lime-copper spray which would give me a higher percentage of lime than would be deposited there.

Q. That is what is commonly referred to as a Bordeaux mixture? A. Right.

Q. They had been sprayed with a Bordeaux mixture which contained lime, is that correct?

A. That is, had been sprayed with a Bordeaux mixture.

Q. Did you take any leaves off the apricot trees at that time? A. No.

Q. You took leaves off of what type of tree?

A. Took it off oak trees and citrus trees, and took some of the weeds along the little stream.

Q. Have you any of those that you took?

A. No, they were all used up.

Q. They were used up. Except from what people told you, you don't know how long a period had passed in which any deposit was made on these leaves, is that correct?

A. Well, of course, on the weeds the deposit was made this year, because it was new growth. Now, on the others the deposit was unquestionably a carry-over.

Q. What distinction did you find between the deposit on the weeds and the other types that were carry-overs? A. In quantity?

Q. Both in quantity and thickness and in any way?

(Testimony of F. E. Twining.)

A. The quantity on the weeds was very small, as I gave the figures this morning. There was almost 50 times as much on the oak twigs and leaves as there was on these weeds.

Q. Fifty times? A. Yes.

Q. How old were the weeds?

A. Well, I don't know. They were this year's crop of weeds.

Q. What I am trying to find out, Mr. Twining, is this: The length of time of the deposit on the weeds as compared to the length of time of the deposit on the oak leaves.

A. On the weeds it couldn't have been only a matter of a very, very few weeks, whereas on the oak leaves it might run over—well, it would be probably over a year anyway.

Q. It would be practically ever since the plant started operation?

A. Undoubtedly a small part of it was right from the [131] first time any dust was deposited.

Q. In other words, on the oak leaves it would be an accumulation from the beginning of the deposit of dust? A. Yes.

Q. And on the weeds it would be a deposit simply from the time that they had leafed out, is that correct? A. Right.

Q. You say fifty times as much. Have you some figures there as to that?

A. Just offhand. Here the figures on the weeds are .09—that is .09 of 1 percent.

Q. What are you reading from?

(Testimony of F. E. Twining.)

A. That is the total deposit on the vegetation.

The Court: He wants to know what you are reading from.

A. I am reading from page 3 of Exhibit 4, I think. That would be column 3, are the weeds. The total percent of deposit on the weeds was .09, and it runs on the other—runs from 1.71 up to 4 percent. I just took the figures—4 percent would be not quite fifty times as much as on the weeds.

Mr. Moore: I may say, your Honor, that the witness is referring to Plaintiff's Exhibit 6, page 3. That is correct?

The Witness: On what?

Mr. Moore: Q. Page 3?

A. It is page 3.

Mr. Naus: Page 3, Exhibit 4.

The Witness: On 4.

Mr. Moore: No; pardon me. [132]

Mr. Naus: Mr. Moore, here is what happened; I might explain that. Page 3 of Exhibit 4 is identical with the original exhibit 6, because there are just two pages of that letter admitted as Exhibit 4 marked separately. When the whole document came in later without objection it took a separate number covering the whole. So this is page 3 of Exhibit 4.

Mr. Moore: It didn't come in without objection.

Mr. Naus: I won't dispute with you as to how it came in. The record speaks for itself. I stand on the record.

(Testimony of F. E. Twining.)

Mr. Moore: The conclusions were objected to the analytical portion is admitted.

Mr. Naus: The record is self-explanatory about it and I don't think it needs discussion.

Mr. Moore: We are in perfect agreement.

Q. Now, if you will turn there—you found the total weight of calcium carbonate, CaCO_3 , grams on the oak leaves .514, is that correct?

A. Well, the total weight of calcium carbonate in grams on the amount of material was .015. That is on the weeds. Which one do you want now?

Q. No; I was talking about the column as to oak leaves, column 1.

A. Column 1 is .514.

Q. And column 2, citrus leaves, .109, is that correct?

A. That is right.

Q. And column 3, weeds, .015?

A. Yes.

Q. And on oak twigs and leaves, the large sample, 1.432, is that [133] correct?

A. Yes.

Q. These were gathered by yourself on what date?

A. March 14th.

Q. 1944?

A. Yes.

Q. Let me ask you this: The weeds were of that year's growth so they only had on them the deposit for 1944, is that true?

A. Yes.

Q. Item 1, the oak leaves, how about them?

A. Well, that is a deposit that had been on there—at least it was a carry-over from the year be-

(Testimony of F. E. Twining.)

fore; maybe a little bit previous to that,—subject, however, to some being washed off during the rainy season through the winter.

Q. And column 2, citrus leaves—how about their character or the dust on them?

A. The total percent was 1.71. That was around in front of the house, more or less protected.

Q. Mr. Twining, what I am trying to get, you have analyzed this in four columns.

A. Yes.

Q. No. 1 being oak leaves, small sample; No. 2, citrus leaves; No. 3, weeds, Wong Creek north of house; No. 4, oak twigs and leaves. What I want to ask you, so I get these four columns correct, which ones had the deposit for 1944 and which had the accumulation of deposits for previous year?

A. Just the one sample, weeds, was new growth. The others were old samples.

Q. In other words, column 3, which is the weeds, were the new growth? A. Yes. [134]

Q. And they would indicate the 1944 deposit?

A. Yes.

Q. Now, going down you found calcium carbonate, CaCO_3 as part of this deposit, did you?

A. Yes.

Q. Now you found—I am following you down—magnesium carbonate, MgCO_3 —you found that as a part of this deposit. is that correct?

A. Yes.

Q. Then you found some silica?

A. Yes.

(Testimony of F. E. Twining.)

Q. That was in rather minor quantity, was it not?

A. Well, I might say the idea of getting the silica and so on and so on was to see approximately how much road dust there might be in it, or other dust. The magnesium and calcium would indicate the dolomitic material.

Q. Then you found a certain amount of iron and alumina? A. Yes.

Q. That was in rather minor quantities?

A. Yes.

Q. So if I get your report correctly, from the analysis of this dust that you found on the leaves there it consisted of calcium carbonate, magnesium carbonate, and a small amount of silica and a small amount of iron and alumina, is that correct?

A. That's right.

Q. You say there: "The lime and magnesia"—referring to a portion of your report—"are deposited as oxides but gradually form carbonates when exposed to the air." A. Yes.

Q. What do you mean by "oxides"?

A. Well, it is—it wouldn't all be oxides when it came out of the flue stack, but a good [135] part of it. That is calcined material. Now, exposed to the air it absorbs carbon dioxide and reverts.

Q. May I ask you to take that blackboard again a moment? I think you said that when it came out of the stack it comes out with carbon dioxide and calcium oxide and magnesium oxide. Now,

(Testimony of F. E. Twining.)

when you speak of oxide you refer to calcium and magnesium oxide, is that correct?

A. That is right.

Q. Now, will you show the court what happens chemically, how these oxides are converted into carbonates?

A. It is a reversion process (writing on blackboard).

The Court: What is that? I didn't follow him.

A. There is a certain amount of carbon dioxide in the atmosphere; there is a certain amount given off from plants. Now, when this oxide is deposited or goes into the air or on the ground, it takes up some of this carbonate and reverts back to its original condition as a carbonate.

Mr. Moore: Q. In other words, if you followed the double entry system of bookkeeping that chemists use, when you get calcium oxide and carbon dioxide, what is the other side of the ledger?

A. Well, it is a proposition here by heat we drive off this gas. The oxides have an affinity for carbon dioxide. Therefore, they will take it up if there is any present, which there is in the atmosphere, and they revert back to their original condition of magnesium and calcium carbonates.

Q. In other words, when this calcium oxide and magnesium oxide [136] is exposed to the air they pick up carbon dioxide, is that correct?

A. Right.

Q. And they reconvert themselves, if we may

(Testimony of F. E. Twining.)

use that term, into calcium carbonates and magnesium carbonates? A. That is right.

Q. In other words, they become dolomite again, is that correct?

A. Well, yes. The exact proportion may not be the same as the original. It depends a little on how they are deposited, but it goes back. It is dolomite.

Q. As a matter of fact, dolomite varies?

A. Oh, yes.

Q. In the percentage of magnesium carbonates?

A. Yes.

Q. And calcium carbonates that go to make it?

A. We can get limestone with very little magnesia in it; we can get dolomitic limestone and dolomite. Then we can get magnesite with certain—more or less lime in it.

Q. But, to put it in a very general way, from a scientific standpoint this dust which is calcium and magnesium oxide picks up carbon dioxide and reconverts itself into dolomite?

A. In picking up your carbon dioxide it really acts something like a cement and forms this incrustation which is more or less permanent. It doesn't wash off like ordinary dust.

Q. You are referring to this deposit on the trees? A. On anything.

Q. On anything. Let me ask you in connection with that, Is dolomite a fairly common deposit found throughout the country? [137]

(Testimony of F. E. Twining.)

A. There is quite a few deposits in California. Of course, we get good and bad deposits.

Q. It varies; I mean, it has other minerals mixed with it? A. Decidedly.

Q. And silica and things?

A. We get lime——

Q. It is commonly referred to as limestone, is it not?

A. Well, limestone itself, if we want a perfectly good limeston we don't—it depends on how it is going to be used; we don't want very much magnesia in it. If we can get magnesium carbonate without any lime, it would be worth while, too.

Q. You mean in this present day?

A. Yes, sir.

Q. On the development of new materials, that a straight magnesium oxide—a mountain of that would be very valuable, wouldn't it?

A. That is right.

Q. One of the problems that they are having in the manufacture of magnesium is to get rid of the calcium, isn't that true?

A. That is one of the problems for certain purposes, yes; in fact, most purposes.

Q. Most soil has limestone in it or dolomite, hasn't it?

A. Well, we find lime and magnesia in most soils.

Q. It is known as one of the nutrient elements of soil? A. Yes.

(Testimony of F. E. Twining.)

Q. Commonly referred to, there are about six. are there not—potassium, magnesium, and calcium——

A. Well, magnesium and calcium are acquired; they are generally what we generally call soil amendments, but there is a certain percentage [138] absolutely necessary.

Q. Take that vicinity in and about Salinas there; isn't most of that soil in there more or less impregnated with calcium and magnesium?

A. We find soils that are more or less heavy in them, but there is many, many soils—we handle thousands of them from the Salinas district that we recommend the application of gypsum. That is calcium sulphate.

Q. You recommend that they——

A. Have some lime added.

Q. —be treated with lime? A. Yes.

Q. In other words, from an agricultural standpoint, you always have the variation depending upon the plant life that is expected to be grown, between what are commonly called alkali soils and acid soils; is that correct?

A. Yes. For acid soils there would be no question about its application. On alkaline soils, why, we get—we very often recommend lime, although lime itself is alkaline earth, because we get less toxicity in mass action. The lime assists——

Q. All through that country down there, particularly around Salinas, it is more or less predominantly alkaline soil, isn't it?

(Testimony of F. E. Twining.)

A. Oh, there is lots of good soil, and there is some bad.

Q. I mean by that——

A. It all has an alkaline reaction.

Q. It all has an alkaline reaction?

A. Most of the soils in California have.

Q. Where you get an acid condition, it is usually caused by [139] heavy liquidity, the alkali is leached out of the soil, is that so?

A. I recommend it for a soil where there is a slight acid or where they are heavy type soils, I have recommended lots of that Salinas beet sugar lime.

Q. Let me ask you this: This Bordeaux mixture, that is a lime deposit, isn't it?

A. It is a lime-copper combination.

Q. I was going to ask that in just a moment. You heard the testimony this morning about the usual consistency of Bordeaux mixture of lime and copper sulphate, where they have five parts of lime, five parts of copper sulphate with fifty parts of water——

Mr. Naus: Fifty gallons of water.

Mr. Moore: Fifty gallons. Thank you.

Q. Cutting out the water for the moment, the H_2O , will you write down the chemical formula for Bordeaux mixture? Or, include the water, too.

A. The Bordeaux mixture is rather a complex mixture. I don't know that I could give an exact formula from memory. When you have 92 elements and their various combinations of millions

(Testimony of F. E. Twining.)

of different substances, it is pretty hard to remember all these things.

Q. Aside from the minor items, let us try to get the major items.

A. Well, for instance, copper sulphate—I have forgotten the exact atomic weight of copper. “Cu” is the term for copper, and sulphate would be SO_4 . I would have to make that X, because I am not sure. You combine that with lime—would be a—— [140]

The Court: Q. Do you call that lime or lime sulphur?

A. In this particular case it is a copper sulphate with lime in this Bordeaux mixture.

Q. Where did I get the Bordeaux mixture as lime and sulphur?

A. Well, lime and sulphur mixture is a little different from the Bordeaux, the one using calcium hydroxide. The calcium hydroxide added to copper sulphate then forms the various compounds which produces your Bordeaux mixture. Now, your other mixture is lime and sulphur; it hasn't any copper in it, unless it happens to have some put in.

Mr. Moore: Did your Honor desire——

The Court: No, I was talking of my own limited knowledge of this field of chemistry and my experience with it, and I just had something in mind. Proceed.

(Testimony of F. E. Twining.)

Mr. Moore: Q. The calcium hydroxide there, that is calcium, water, and what else?

A. Well, calcium——

Q. H_2O is water, isn't it?

A. Yes. It would start out with calcium oxide.

Q. Yes.

A. You add water to it. Therefore, you have got CaH_2O taken twice, you have got to add——

Q. In other words, you have two parts of water to one part of calcium oxide, is that correct?

A. Yes.

Q. That is known as calcium hydroxide?

A. That is right.

Q. Let us reduce that to the terms that we common people know. What is that known as—slacked or unslaked lime? [141]

A. Slacked lime or hydrated lime.

Q. In other words, the water in there slakes the lime, is that correct? A. Yes.

Q. When these dusts go through the air they pick up water, too, don't they? A. Yes.

Q. And they become calcium hydroxide, do they not?

A. Your lime—both your lime and magnesium will pick up some moisture, and therefore they will carbonate quicker.

Q. In other words, calcium hydroxide is also known as calcium carbonate, is that correct?

A. No.

Q. No, I am wrong; I beg your pardon. But

(Testimony of F. E. Twining.)

calcium oxide will pick up H_2O from air, will it not?

A. It has a great affinity for water. A little moisture is picked up, and it unites with the carbon dioxide a little quicker if it is slightly moist.

Q. In other words, the dust that comes out of the stacks will pick up water out of the air and become slaked lime?

A. Yes. That is still caustic.

Q. What is?

A. Slaked lime is still caustic.

Q. I am going to come to the causticity of this later. What I am getting at now: Does that pick up H_2O out of the air and become slaked?

A. If there is any moisture in the air.

Q. Of course, it all depends upon the amount of moisture that is in the air and the amount of time that it is exposed to the action of the air, is that correct?

A. That is right.

Q. In other words, let me ask you, would it become slaked more [142] quickly than in a dry air with no moisture?

A. Yes.

Q. So, the length of time it takes to change from a slaked to an unslaked lime, if you term it that, is dependent upon weather conditions?

A. Yes, the time would be—would depend on that.

Q. Now, isn't it true that in Bordeaux mixture you do use unslaked lime at times?

A. Yes.

Q. In other words, trees are sprayed with unslaked lime, is that correct?

(Testimony of F. E. Twining.)

A. Well, of course, when you make your mixture, you usually get a combination. You get more reaction from unslaked lime than you will from slaked lime.

Q. The Bordeaux mixture is used for the purpose of killing bugs, if we may term them that, or fungus, isn't that true? A. Yes.

Q. It is the unslaked causticity of the application that has its effect on that fungus growth?

A. Yes.

Q. In other words, you are not using a dead instrument, if we might call it that: you are using a live instrument with causticity in it to kill the bugs or fungus? A. That is right.

Q. So, isn't it a fact that usually with a Bordeaux mixture it is fundamentally unslaked lime when it is sprayed on the trees?

A. Bordeaux mixture is caustic.

Q. It is caustic? A. Yes.

Q. Fundamentally, from a chemical standpoint, the calcium dust [143] or the magnesium dust or the combination of it that comes from these stacks, is very—practically identical with the calcium that is contained in Bordeaux mixture, is it not?

A. No, I wouldn't say that.

Q. Where does the difference lie?

A. I would say a dust from your—the flue dust is a little more caustic than it is in Bordeaux.

Q. You would say what?

A. It is more caustic.

(Testimony of F. E. Twining.)

Q. Let's get into that now. What element is there in there that is the creation of the causticity?

A. Well, in one case it is lime; in the other it is lime and magnesium.

Q. Is it the metal itself, or is it the oxygen or hydrogen or just a mixture?

A. It is what we would term a salt of the metal.

Q. Let me withdraw the question or change it. By "causticity," I wonder if you and I are thinking along the same lines. What is your meaning of causticity?

A. Well, I possibly might explain it as an alkaline——

Q. What is the element that causes causticity, or how do you judge causticity?

A. Well, of course, we have a method of measuring that by what we might term the P.H.—hydrogen potential: but the causticity would depend entirely upon the purity of your calcium oxide or magnesium oxide. If it is absolutely pure it would be more caustic than if——

Q. I think you and I are talking at different purposes. P.H. is [144] usually applied to the determination or to the causticity or acidity of soil. I am talking about causticity in its general sense rather than applied to soil. But as I understand causticity—and correct me if I am wrong—it means the element that will consume or burn up matter.

A. Causticity—you might define it that way. I might explain it, on your Alpha lines, or materials,

(Testimony of F. E. Twining.)

there are what we call basic materials, and they will unite with the acid materials, and if we get a proper amount of acid basic materials we will get a neutral salt. And one proposition about a caustic—a mixture of we will say a dolomitic material or lime material or magnesium material—, it is slightly alkaline and unites with the acids secreted by the—in a pistil—that is, the stigma, and if it neutralizes it, then you prevent fertilization. That is the proposition.

Q. I am going back to the fundamental question which I am trying to get at, the causticity. Will you give us a definition of what is causticity?

A. Well, causticity would be—I might give a definition, when it attacks certain materials. We know it generally as something that actually attacks or eats other tissues.

Q. Bordeaux mixture has causticity, has it not?

A. It has some, yes.

Q. The very purpose of using it is to kill fungus and growths of that kind, is it not?

A. Absolutely. Your copper also has [145] an antiseptic effect—that is, a toxic effect, rather.

Q. Are “toxic” and “caustic” synonymous?

A. No.

Q. Or are they different terms?

A. No, they are different terms.

Q. But the calcium hydroxide that is in the Bordeaux mixture has causticity, has it not?

A. Well, a Bordeaux mixture—I have seen some

(Testimony of F. E. Twining.)

that were practically neutral, and others that were rather caustic.

Q. Well, the purpose of using a spray is to have a caustic spray, is it not?

A. Well, generally, although your copper will do some of the work.

Q. Would you say that calcium carbonate was alkaline?

A. Calcium carbonate is what we would term an alkaline earth.

Q. Is that caustic? A. No.

Q. That is neutral, is it not?

A. Neutral, yes.

Q. In other words, what comes out of this——

A. I would have to explain that further, because if you add it to any acid——

Mr. Moore: Pardon me. I didn't get that. Would you read it. Mr. Reporter.

(Answer read as far as given.)

A. Then you—most acids are stronger than the carbon dioxide, and you will convert it into another salt, and you——

Mr. Moore: Q. I asked you—maybe I didn't follow you—calcium hydroxide is neutral, is it not?

A. Yes—no, not calcium hydroxide. [146]

Q. Calcium carbonate is?

A. Calcium carbonate is supposed to be neutral, yes.

Q. Calcium oxide has a certain amount of caustic character, has it? A. Yes.

(Testimony of F. E. Twining.)

Q. Now, you were talking about the fertilization a few moments ago wherein this pollinization or fertilization was interfered with by reason or an alkali deposit.

A. The neutralization of the acid deposit of the stigma.

Q. Well, getting down to what I might term the sex life of an apricot, the acid condition of the stigma there is an acid condition, is that correct?

A. That is right. There is an acid secretion.

Q. And the pollinization is an alkali deposit, is that correct, or am I in error?

A. No; pollinization of course is prevented by the neutralization of that acid secretion.

Q. In other words, if that acid secretion is turned to an alkali, in your opinion it will prevent pollinization, is that correct?

A. I couldn't say it had to be turned into an alkali, but if it is neutralized. In other words, the dusting of any alkaline earth on a blossom at a certain time will prevent the setting of fruit, no question about that.

Q. In 1943 you don't know what happened down there on that Pista ranch from your own knowledge?

A. I wasn't there.

Q. You never saw it until——

A. I possibly have seen it, because I have been by that territory. [147]

Q. I mean, you never examined it?

A. Not to know it, no.

(Testimony of F. E. Twining.)

Q. And the first time you came in contact with that ranch was in '44?

A. Personal contact, yes.

Q. Now, in 1944 how many times did you visit it?

A. There were three trips made to that orchard.

Q. When was the first one?

A. March 14.

Q. When was the second? A. June 22.

Q. What was the condition of that orchard on your first visit insofar as buds were concerned and the apparent yield?

A. The orchard was in bloom. I didn't make any careful examination at the time, because it would be the wrong time to determine whether there was anything there. As I say, it had been sprayed. I knew there was lime present, so I didn't take any samples.

Q. It had been sprayed? A. Yes.

Q. With Bordeaux mixture? A. Yes.

Q. And did it give the evidence of a good yield at that time?

A. Well, it was in bloom. The bloom was pretty good.

Q. Did you examine the orchard carefully?

A. I just walked through it.

Q. With Mr. Pista? A. He was along, yes.

Q. Who else was along?

A. I had my son with me, and I think a son of Mr. Pista, and Mr. Harrington, were all there.

(Testimony of F. E. Twining.)

Q. And you looked the orchard over pretty carefully, didn't you?

A. I went through it. I just made a casual examination. [148]

Q. Was there a good bloom at that time?

A. Pretty good bloom.

Q. Did you see any evidence of the dust at that time? A. Yes.

Q. Will you describe as carefully as you can to his Honor just what you saw there with respect to the dust.

A. I have got the figures to show just exactly how much dust had been deposited on the new vegetation.

Q. Will you give us that figure.

A. That is in column 3, page 3, Exhibit 4.

Q. Now, you say there was—that is column 3?

A. Column 3, yes.

Q. You say "Weight of sample, grams, 27.2."

A. That's right.

Q. Will you tell us just what you mean by that?

A. Well, that is the weight of the sample that was examined. It weight 27.2 grams.

Q. What did you do to come to that determination?

A. We weighed it. The sample was taken to the laboratory and weighed in order to get the weight.

The Court: Q. What does that consist of? Give us some idea.

(Testimony of F. E. Twining.)

A. That was some weeds that were growing along this little stream, and was the principal foliage there was in the orchard.

Q. That is new growth?

A. That was new growth.

The Court: All right, proceed.

Mr. Moore: Q. And all of these figures in column described the result of your analysis of those samples you took [149] from the weeds, is that correct? A. That is right.

Q. By the way, was that a wet or dry weight when you speak of grams?

A. It was a partially dry.

Q. It was what? A. Partially dried.

Q. Personally? A. Partially.

The Court: Partially dried.

Mr. Moore: Q. Partially. Can you explain that in a little more detail?

A. Of course, the examination was not made immediately, and there was a certain amount of drying of the leaves due to that. I might explain that further so there would be no—this deposit, by being put in ordinary water, doesn't wash off well, so it was put in acidulated water.

Q. Pardon me. Put in what?

A. Acidulated water—water with some acid in it to dissolve the lime and magnesia compound.

Q. And that was the process you used in making these figures? A. In all of these, yes.

Q. Did you examine the apricot trees on that visit?

(Testimony of F. E. Twining.)

A. No—that is, just went through the orchard and looked at them.

Q. Did you notice whether there was dust on them?

A. Well, as I say, they had been sprayed, and of course they had a deposit on them, and I knew that that would interfere with the actual deposit in this particular case.

Mr. Moore: I am going to ask that that portion be stricken as not responsive. You did observe dust on the trees? [150]

A. I observed a coating on the trees.

Q. How about the leaves?

A. Well, the leaves had not developed very much.

Q. Were there any buds out at all?

A. Oh, yes.

Q. Were there any deposits on the buds?

A. I didn't examine them. None that I could see visually. I know that was very small.

Q. If you didn't examine it how did you know that it was small?

A. Well, I examined—I looked at it.

Q. Was there or was there not dust on the leaves?

A. Not that was perceptible to the naked eye.

Q. Let me ask you, You found dust on these weeds, is that correct? A. Yes.

Q. How do you account for the fact——

A. The weeds were probably several weeks old.

Q. When did you visit the orchard again ?

(Testimony of F. E. Twining.)

A. The next visit to the orchard was made on June 22.

Q. That is 1944? A. Yes.

Q. What was the condition then, Mr. Twining, of the orchard so far as dust was concerned?

A. There was some dust on the leaves and the apricots. That is shown in the figures on page 4 of your Exhibit 5.

Q. Did you notice the trees at that time and the apricots that were growing on them?

A. Well, I noticed that there was a pretty good crop on them. [151]

Q. A pretty good crop? A. Yes.

Q. Did you know or had you been informed as to whether or not there had been any thinning process carried on? A. No.

Q. Between your two visits? A. No.

Q. You never asked about that? A. No.

Q. Would it surprise you that on one tree they had taken off over 6,000 apricots in the thinning process in the early part of May?

A. Well, I am not surprised at anything any more.

Q. What?

A. I am not surprised at anything any more. I hear a good many stories. I suppose that is—

Q. You never examined that orchard in the spring of 1944 to determine whether or not it had a good yield or a poor yield?

A. I stated that it looked good to me.

Q. It looked good to you? A. Yes.

(Testimony of F. E. Twining.)

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A. I stated that it looked good to me.

Q. It looked good to you? A. Yes.

(Testimony of F. E. Twining.)

Q. Well, in your opinion, did any deposit of dust in 1944 in any way affect the yield or the pollinization of that crop of apricots on the Pista ranch? A. Apparently not to any extent.

Q. Not to any extent? A. No.

Q. In 1944, is that correct?

A. That's right.

Q. But it is your opinion that it did affect it in '43, is that true?

A. Well, in taking the total amount of material and figuring that that was deposited in '43, I know that that material will cause some damage. Now, I didn't check up on the bloom or the dropping of fruit, so I can just give it as an opinion. [152]

Q. In other words, you are calculating from the result to the cause rather than from the cause to the result, is that right?

A. I am calculating from the cause, yes.

Q. Now, might it not be possible that in 1943 that a short crop was due to other elements or factors rather than the dust from this—

A. Well, taking into the case this particular case—taking into consideration and knowing there was a short crop, I still think it was shorter than it should have been.

Q. But you never saw the trees; you don't know anything about it? A. Not at that time.

Q. Let me ask you something: Have you ever been employed by Mr. Pista before in your life?

A. Not that I know of.

Q. Not in 1938? A. No.

(Testimony of F. E. Twining.)

Q. You weren't employed in any way in regard to a suit that he filed for damages to his orchard?

A. No, sir.

Mr. Moore: Might we have a recess, your Honor?

The Court: Certainly.

(Recess.) [153]

Mr. Moore: If your Honor please, with Mr. Naus' consent I am offering now in evidence Defendant's Exhibit A, which has been marked for identification, which is a flow sheet of this entire process of making magnesium, and in that connection photographs 1, 2, and 3 have to do with the process at Natividad outside of Salinas, and the balance has to do with the pictures of the processes at Moss Landing and at Permanente.

Mr. Naus: That is correct. Steps 1, 2, and 3 in the flow are all that occurred in this plant down near the Pista orchard.

(The document was thereupon received in evidence and marked "Defendants' Exhibit A.")

Mr. Moore: Q. Mr. Twining, let me ask you, you say that in your opinion if it had not been for this deposit of dust in 1943 that the yield of the Pista orchard would be seven, eight, or nine times greater than it was; am I making a correct statement of your testimony?

A. No, I do not want it as a direct statement. If it had not been for this dust, I give it as an opinion that this dust affected it, and taking some other

(Testimony of F. E. Twining.)

things into consideration, he should have had a crop of, I would say, eight times what he did.

Mr. Moore: Will you read the last part of that answer?

(Record read.)

The Witness: I would not specify exactly what he should have had, but I am just stating what he should have had under [154] varying conditions.

Mr. Moore: Q. What other things did you take into consideration?

A. Well, the general conditions during the year, and assuming the climatic conditions, the cultivation and so on, were properly handled.

Q. I don't quite understand you—the climatic conditions were properly handled.

A. Well, not being there, you might have had a snowstorm in the first of April, or a heavy frost, or something of that sort. I practically know that he did not, but I say those things might happen.

Q. Let me ask you something: You were employed by Mr. Pista when? In 1944?

A. Well, it was—I can't remember. I may have a letter to show when I was first asked to come and make an examination. I know at the time I was ill I did not get over there as early as I expected. It was either the early part of this year or the latter part of last year.

Q. In your investigation did you get any weather reports?

A. You have the complete reports that I made.

Q. Will you kindly turn to them so we can refer to them? A. Exhibits 4 and 5.

(Testimony of F. E. Twining.)

Mr. Naus: I do not think the parties understand each other. Mr. Moore sort of dropped his voice when he said the word "weather." I do not think the witness heard him say that.

Mr. Moore: I will repeat the question.

Q. In your investigation of the short crop on the Pista orchard, [155] did you get any weather reports?

A. I did not investigate the weather reports from that particular district, no.

Q. Before you came on the stand today as a witness in this case, have you ever had the reports from the United States Weather Bureau relative to the rainfall or the temperature in that district in the period of pollinization?

A. I would state that I have those reports, but I did not read them.

Q. You have never read them?

A. No, we received them down there.

Q. You don't know what the weather conditions were in or about Natividad in the spring of 1943?

A. Only on the particular days I was there, on March 13th and 14th.

Q. That is 1944, is it not? A. Yes.

Q. I am referring now to 1943.

A. I don't know. I made a good many trips over to Salinas in 1943, the winter of 1942-1943, and the summer of 1943, but off-hand I do not know just what the weather was.

Q. You have never studied those weather records? A. No.

(Testimony of F. E. Twining.)

Q. You know, do you not, that throughout the State of California in 1943 there was a short crop in apricots? A. Yes, I know that.

Q. Did you ever have occasion in your profession to study the cause of the short crop throughout California in 1943?

A. Our work is devoted specifically to some particular place. For instance, we do work for a great many—— [156]

Q. Let us restrict ourselves to the matter of apricots.

Mr. Naus: He said to some particular place. Your question takes in the whole State of California.

Mr. Moore: I am going to narrow it down.

Q. Let us narrow it to the question of apricots. In any particular area did you ever have occasion to study the cause of the short crop in 1943?

A. In this way: In 1943 we had occasion to examine, oh, I would say several thousand soils in Monterey County, and some of them were of apricot orchards that did not produce well, that we had to examine the soils to see if they had anything to do with it.

Q. I am not asking you about soil examination. I am restricting my question solely to the question of a short apricot crop in 1943.

A. Generally, I did not investigate to see why it was.

Q. Did you investigate with respect to any particular area where there was a short crop?

(Testimony of F. E. Twining.)

A. Only on soil conditions.

Q. What is that?

A. Only on soil conditions.

Q. You made no investigation or study of any kind, character or description relative to the effect of a particular weather, climatic conditions that occurred in 1943, so far as it affected the apricot crop, is that correct?

A. That is pretty general. I might say "No" to that question, because I made no specific examinations based on that.

Q. You do know that there was a short crop?

A. Yes. [157]

Q. Did you make any investigation as to the cause of that short crop throughout the——

A. As I say, only soil conditions for some individuals.

Mr. Moore: I think that is all, you Honor.

Redirect Examination

Mr. Naus: Q. Mr. Twining, you were asked about the spraying of Bordeaux mixture on apricot trees. Is it the practice to spray the Bordeaux mixture on the trees during blossom time, or before or after blossom time?

A. They use some care to prevent the spray getting into the blossoms at blossom time, yes, unless it is absolutely necessary, and then it is used very dilute.

Q. Does the spraying of Bordeaux mixture in what you have described as a very dilute mixture,

(Testimony of F. E. Twining.)

if done during blossom time, have any effect on pollinization or fertilization?

A. The lime in the spray might affect the pollinization.

Q. Does it prevent pollinization to the extent of preventing the set of a crop?

A. If it is in sufficient quantity it would.

Q. Pardon me?

A. If in sufficient quantity it would, yes.

Q. If in——

A. If in sufficient quantity.

Q. Take the quantities that we have been discussing here.

A. It would have to get in the blossoms and on the pistils.

Q. Take the quantities that have been mentioned here as being a mixture of 5-5-50. Is that a sufficient quantity?

A. Well, sprayed right into the blossom at the proper time it would cause trouble. [158]

Q. Is it the practice in spraying Bordeaux mixture in apricot orchards to spray it on in a general way as to interfere with pollinization?

A. No.

Mr. Moore: Wait a minute.

Mr. Naus: Is that a general request or a command to halt, or is it an objection?

Mr. Moore: I intended to make an objection but I was too late.

Mr. Naus: Perhaps I had better pass to another question.

Mr. Moore: Very well.

(Testimony of F. E. Twining.)

Mr. Naus: Q. Now, this dust that came out of the stack, wafted through the air, and settled down on the Pista orchard in the quantities that your analyses of the 1933 samples showed, was that in sufficient quantity to definitely prevent fertilization or pollinization?

Mr. Moore: Wait a minute. I am going to object that that. I would like to have the question read first, your Honor.

(Question read.)

Mr. Moore: I object to it, your Honor, as a hypothetical question, no foundation in fact having been laid, because I do not know that this witness has testified in the slightest way to the amount of dust deposited in 1943 during the period of pollinization, and I therefore think the question is objectionable.

Mr. Naus: If the Court please, I do not understand that a [159] land owner or a farmer has to be defeated in the case unless he has a scientist or an army of them sitting out in his orchard during a particular period, blossom time or otherwise, and I certainly have laid all the foundation in this case that could conceivably be laid. We definitely connected the dust that settled on the orchard with something that came out of that stack, and there are samples of the vegetation in here, as to which there is an analysis of the quantity, and I am directing it to that part of the record from the standpoint of quantity, which the cross-examination did not quite reach into in trying to compare Bordeaux

(Testimony of F. E. Twining.)

mixture with this dust, and I am trying to compare the chemical ingredients of the Bordeaux mixture with the quantity of other ingredients in the dust to see if one would and the other would or would not prevent fertilization or pollinization.

Mr. Moore: My objection, your Honor, goes to the fact that there has been no foundation laid in fact for this question. This witness was not present during the period of pollinization, blooming. He has not introduced any evidence, whatsoever of the amount of dust deposited at that time, or the character of the dust deposited at that time. He does say that there were some leaves sent him, and that a year afterwards, in 1944, when they had a large crop, in the period which would be very close to the period of pollinization he was present on the ground down there and observed it. But there is absolutely no [160] evidence of the amount of dust which was deposited in February and March of 1943, and that is the question that is asked.

I also object to it on the ground that it is not proper redirect examination. I did not go into that question on cross-examination.

Mr. Naus: If the Court please, so far as improper redirect is concerned, the cross-examination, as near as I could discover a point in it, assuming one, was trying to suggest that the chemical ingredients of the dust corresponded in a general rough way to the chemical ingredients of a Bordeaux mixture. That leaves untouched the question of quantity. I have already asked the witness the quantity

(Testimony of F. E. Twining.)

in this 5-5-50 mixture, which is spoken of as very dilute. I am now addressing the question to the other branch, that is, the analysis of this material deposited in March, 1943.

The Court: The objection goes to the failure of a proper foundation being laid, namely, this witness on the stand was not there during the period of pollinization. No. 1. No. 2, that the quantity of dust from his examinations during that period was what?

Mr. Naus: That is in the reports, in the exhibits shown here. That shows specifically the quantity.

The Court: Maybe in the interest of time I will allow the question to be asked. It goes to the weight of the testimony.

(Addressing the witness:) Do you understand the question? [161]

The Witness: Will you read the question?

(Question read.)

The Witness: I would state that if deposited in that ratio through the year it would cause considerable trouble.

Mr. Naus: That is all.

Recross-Examination

Mr. Moore: Q. You say if deposited during the year would cause considerable trouble. Do you know the amount of dust that was deposited on this property in the month of February, 1943? A. No.

Q. Do you know the amount of dust that was deposited in the month of March, 1943?

(Testimony of F. E. Twining.)

A. No.

Q. Do you know the amount of dust that was deposited in April, 1943? A. No.

Q. Do you know if during those three months this plant, Permanente plant, was in constant operation.

A. That would be a question that I would have to base the other answers on. If I knew just exactly how they ran through those months I might give you an estimate of how much was deposited.

Q. In other words, your answer is purely a guess, am I right?

A. If that was deposited uniformly throughout the year there was unquestionably some damage at the blossom time.

Q. Do you know that the blossoms bloomed down there in three cycles?

A. I know how those things generally happen, yes.

Q. Do you know what happened in 1943?

A. No—you mean so far [162] as the bloom is concerned?

Q. So far as the blooms were concerned and the crop was concerned.

A. I imagine it was in the usual manner.

Q. Do you know that they bloomed for eighteen days? A. That is what I heard.

Q. Do you know that they bloomed in three cycles? A. I heard that stated.

Q. Did you ever hear it before today or yesterday?

(Testimony of F. E. Twining.)

A. Oh, yes—not a time, but I have know it to bloom in three cycles.

Q. Do you know that the buds or the young apri-cots, rather—the buds—dropped off from the first bloom on practically all the ranches in Monterey County?

A. I do not know that, no.

Q. You heard it yesterday, did you not?

A. That is all, just hearsay.

Q. What you know about the Pista ranch is also hearsay, isn't it?

A. As to 1943, yes, outside of those examinations.

Mr. Moore: That is all.

Mr. Naus: No further questions.

The Court: Step down.

Mr. Naus: Is Mr. Twining excused from further attendance, your Honor, or not?

Mr. Moore: I beg your pardon. I did not hear you, Mr. Naus.

Mr. Naus: I was asking his Honor if Mr. Twining is excused from further attendance. [163]

Mr. Moore: Oh, yes.

LOUIS PISTA,

called as a witness by the plaintiff; sworn.

The Clerk: Q. What is your name?

A. Louis Pista.

Direct Examination

Mr. Naus: Q. Mr. Pista, you are the son of B.

(Testimony of Louis Pista.)

Pista, who has already appeared as a witness in this case and who is one of the plaintiffs? A. Yes.

Q. Your age is what? A. 32.

Q. I believe the accounting records of your father respect to this apricot orchard, such records as there are, are kept by you, is that correct?

A. No, I only had a year and a half, is all.

Q. When?

A. I would say 1939 and 1940, and, of course—the latter part of 1939 and 1940.

Q. In the year 1943 did you or not visit the apricot orchard? A. No.

Q. So you know nothing personally or first-hand knowledge about that? A. No.

Q. At the time of the deposition you produced the account books for Mr. Moore to assist your father in going over the records. Do you recall that?

A. Yes.

Q. You brought them here at my request, have you? A. Yes.

Q. Can you produce from your father's records any accounts or [164] records, whatever, that show what apricots were sold from the orchard in 1943, to whom, what date, on what day, the price, and so on? A. Yes. I have that right here.

Mr. Naus: Do you wish to examine that, Mr. Moore?

Mr. Moore: No, no.

The Court: Q. That is, in relation to these apricots? A. Yes.

Mr. Naus: The 27 tons I am speaking of.

(Testimony of Louis Pista.)

The Court: Is there any question about the 27 tons?

Mr. Moore: I do not think so, your Honor, no.

Mr. Naus: Your Honor will recall at the time his father was being examined I suggested the young man could give that detail more quickly, more easily and better than his father.

Mr. Moore: I think we may be able to stipulate to that. We have had no question as to that, and it is in the deposition.

Mr. Naus: I would like, if the Court please, to have the witness state the quantity, the selling price per pound or per box, to whom sold, and the dates, to have a simple, short, clear-cut record here.

A. This is Los Angeles.

The Court: Raise your voice so the reporter can hear you.

The Witness: This is Los Angeles, which is on a per-pound basis. On July 3, 1943, Anshin Produce Company, received 40 lugs of apricots. 17 were sold at 11 cents and 23 lugs 10 cents. [165]

Mr. Naus: Q. Before going on, a lug is how many pounds? A. You mean the wood?

Q. Apricots.

A. Well, 26½ to 27 pounds net, that is, of the fruit.

Q. Proceed with the next one.

A. This is Anchin, also: July 7, 38 lugs. Total shipment. 10 were sold at 12 cents, 15 at 11, and 13 at 7.

And this is another merchant, commission merchant, Shapiro Produce Company, and this is on

(Testimony of Louis Pista.)

July 3rd. He received 85 lugs, 69 lugs at 11 cents, 16 10 cents——

Q. Those cents you are speaking of are per pound, are they?

A. Per pound, yes. And on July 6th he received 82 lugs. 66 lugs were sold at 12 cents and 16 at 11. July 7th he received 80 lugs. 17 lugs were sold at 12 cents, 21 lugs at 11, and 22 lugs at 10 cents, and 10 boxes were sold at a dollar apiece.

July 8th, 82 lugs. 4 lugs were sold at 12 cents, 17 10 cents, 42 11 cents, 3 nine cents, 6 five cents, and 10 boxes were lost.

This is a broker, William Pulisevich.

Q. Los Angeles, or San Francisco?

A. Los Angeles. July 2nd he received 151 lugs total. 26 lugs sold at 12 cents, 22 at 11, 74 10, 10 lugs at 9, 15 lugs 8, and 4 lugs he has here "one," but I imagine it is lost.

July 3, 128 lugs. 42 at 12 cents, 85 11, and one at 8.

The Court: I do not think there is any point in going into [166] the detail of this.

Mr. Naus: If counsel will concede that the remainder of the sale was substantially on the same basis I will pass it up.

Mr. Moore: I think a very much simpler way is this: We have taken Mr. Pista's deposition. He has had a chance to read it and sign it. In it we went into the detail of all of those sales.

Mr. Naus: Mr. Moore, I am suggesting I want to go at it in this way as part of the evidence in this

(Testimony of Louis Pista.)

case. I am willing to adopt his Honor's suggestion and discontinue if it can be understood or if everybody is satisfied that the remainder would be in substantially the same order.

The Court: Oh, yes.

Mr. Naus: I think it is. You may cross-examine.

Mr. Moore: We have no questions.

Mr. Naus: The plaintiffs rest.

Mr. Moore: I will call Dr. Duschak.

L. H. DUSCHAK,

called as a witness by Defendant; sworn.

The Clerk: Q. Your name is——

A. L. H. Duschak.

Direct Examination

Mr. Moore: Q. What business are you in?

A. At the present time I am professor of metallurgy in the University of California, and consulting engineer. [167]

Q. Will you kindly tell the Court your professional and educational background?

A. I graduated in 1904 from the University of Michigan, having majored in chemistry. I received the master of arts and Ph. D. at Princeton University in 1908, having majored in chemistry. I taught chemistry for some two years at Princeton University. I was employed for some four years by the Corning Glass Works, as a chemical engi-

(Testimony of L. H. Duschak.)

neer, and then from 1913 to 1921 I was employed by the United States Bureau of Mines as a chemical engineer located here in San Francisco, working for several years with Dr. F. E. Cottrell, who is the inventor of the Cottrell process for collecting dust and fumes. From 1921 to 1938 I practiced as a consulting chemical and metallurgical engineer in San Francisco. In the spring of 1938 I was appointed professor of metallurgy in the University of California.

During my work for the United States Bureau of Mines, and during my consulting practice later, which extends up to the present time, I have had occasion to investigate a number of dust and fume situations related to various industrial plants.

Q. Have you had occasion in that connection to investigate the effect of dust relative to vegetation and the growth of trees, and the matter of agriculture, generally?

A. Only in a rather general sort of way. My interest in the dust has been more particularly with regard to its generation in the plants and its behavior as it escaped from the plant, and the way it dis- [168] tributed itself beyond the plant. I am not particularly experienced as an agricultural engineer.

Q. But you have had occasion along the lines you just mentioned in making investigations?

A. Yes, because in connection with making studies of the smelter fume behavior, as well as the behavior of dust from cement plants, and other dust-

(Testimony of L. H. Duschak.)

producing plants, I have had to consider the effect of dust on various types of plant growth.

Q. Can you tell us in a little more detail what particular instances on which you had occasion to make these studies? I do not mean to go into the detail of cases or things of that sort of the problem, but just a little more detail than you have given.

A. My first contact with this dust and fume problem was in connection with studies of so-called smelter smoke, smelter-fume damage, particularly relating to the conditions around the Selby smelter around the Bay, here. And also, to a lesser degree, the Anaconda smelter in the State of Montana, smelters in the vicinity of the Great Salt Lake, and after that I made studies—in fact, a number of studies—related to the dust problem of the Cowell-Portland Cement Company at Cowell, the dust problem at the United States Lime Products Corporation at Sonora, California, and the Permanente Cement Plant at Permanente, and then recently the Natividad of the Permanente Company.

Q. Doctor, referring to the Permanente plant at Natividad and the manufacture of magnesium, have you been employed by the [169] Permanente concern?

A. Yes, I have.

Q. When did you enter their employ, or when did you first have contact with them relative to employment?

A. My first contact with them was in the spring of 1939. That related to the proposal to construct a cement plant at Permanente, and since that time

(Testimony of L. H. Duschak.)

I have been consulted by them off and on in regard to a number of their operations.

Q. When you say a number of their operations, does that include the manufacture of magnesium metal? A. Yes.

Q. I have dissociated for just a moment this particular dust problem that we have here, but I mean in a general way have you acted as a consulting engineer with regard to the manufacture of magnesium by permanente? A. Yes.

Q. And many matters connected in an advisory capacity, is that correct?

A. Yes. My most extensive work for them was in connection with the early development of this so-called Hansgirg, or carbo-thermic process, which is practiced at Permanente.

Q. You are familiar, are you, Doctor, with this carbo-thermic process of magnesium?

A. Yes, I am familiar with that process.

Q. You have gone through the struggles of this Permanente plant, or you are familiar with all the details, are you? A. Reasonably so, yes.

Mr. Naus: Wait a minute. You can't say he has gone through them all until the Pista case is finished, at least?

Mr. Moore: I mean up to the present moment, Mr. Naus. [170]

Mr. Naus: Pardon me. I will accept the correction.

Mr. Moore: Q. I am going to call your attention, Doctor, to an exhibit which has been intro-

(Testimony of L. H. Duschak.)

duced here as Defendant's Exhibit A, and ask you to examine that——

The Court: Directing his attention to one, two or three?

Mr. Moore: Q. (Continuing): ——directing your attention to 1, 2 and 3, and also the balance, your Honor, but particularly with respect to 1, 2 and 3, which are the plant at Natividad. Will you explain to his Honor the process of the manufacture, if we can term it that, of the magnesium oxide and calcium oxide that are shipped over to Moss Landing—I mean including the quarrying and the chemical reactions that take place.

Mr. Naus: Aren't you assuming that this calcine was the product?

Mr. Moore: I will admit I am leading a little bit.

Mr. Naus: Perhaps he will say those are the products. I don't know.

Mr. Moore: I will reframe the question if you object, but I think the doctor can talk for himself on that subject.

Mr. Naus: All right.

Mr. Moore: Q. Will you explain the process without my——

A. Referring to this flow sheet——

The Court: Come up here, gentlemen, if you want to look at it.

Mr. Naus: I have read that. I can follow it from here. [171]

(Testimony of L. H. Duschak.)

The Witness: The illustration No. 1 shows a power shovel digging broken dolomite in the quarry and loading it into a truck. This truck delivers the dolomite to a crushing plant, which is shown below in the diagram. The crushed dolomite is then taken to the calcining plant, which consists of two rotary kilns with the suitable appurtenances. This crushed dolomite is fed into these rotary kilns and is there heated to a high temperature by the use of either natural gas or oil fuel. The rotary kilns and the stacks from which the gases of the kilns are discharged is shown in illustration 2.

Illustration 3 shows the loading of a truck from one of the storage bins, loading it with the calcine dolomite for delivery to Moss Landing, or to Manteca, or possibly to some other point of consumption.

Q. Doctor, what is the chemical composition of this dolomite that has been referred to? Can you tell us?

A. Dolomite is a mineral which consists essentially of equal molecular quantities of calcium carbonate and magnesium carbonate. If I might refer to this writing made by Mr. Twining on the board, this first item in the circle, here, reading CaCO_3 , MgCO_3 bracketed—that describes the composition of what we might call theoretically pierre dolomite. Sometimes there is a little excess of magnesium carbonate or an excess of calcium carbonate. The composition is not absolutely fixed, that is, there is quite a range of composition of materials [172] which would all be classed as dolomite, and then in

(Testimony of L. H. Duschak.)

addition to these two essential constituents we are apt to find small amounts of so-called impurities, such as silica, iron compounds, and aluminum compounds, and possibly other substances in a small amount.

Mr. Moore: I have quite a number of photographs here. I have extra copies.

Mr. Naus: I will take a look at them if you wish.

Mr. Moore: Q. Doctor, I am handing you some photographs here. Would you pick out the photographs of the plant at Natividad? I have others in there and I know that you are familiar with it.

Mr. Naus: If you have a lot of photographs of the Natividad plant, Courtney, will you pick out some with the wind blowing over toward the orchard?

Mr. Moore: Oh, yes, I have got all kinds. We have, which I will give to Mr. Naus, two photographs, your Honor, of the Natividad portion of this process, which we will offer in evidence.

Mr. Naus: Counsel has handed me two photographs. I will accept——

Mr. Moore: Pardon me, three, Mr. Naus. Here is just the truck up in the mine.

Mr. Naus: This is not the truck, the shovel.

Mr. Moore: There are more than that. Of two of them I [173] had extra copies made, and of the others I had no additional copies, so there are about five photographs, your Honor, of the plant there.

Mr. Naus: Let me have all five and I will give

(Testimony of L. H. Duschak.)

you a consent or a stipulation as to them. There are six.

Are these the six you want to use?

Mr. Moore: Yes.

Mr. Naus: I think they are all true depictions of what they purport to show, if the Court please. I simply request if possible—I do not insist upon it—that as to each one counsel merely state his understanding of the date or approximate date each one was taken.

The Court: Approximately, if you know.

Mr. Naus: I do not press him. I do not want to take time, but if he knows it will help. Mark them separately and then as to any that you do know, give the date.

Mr. Moore: I would rather ask the doctor, because some of them were produced by himself. I will state as to the others, the Permanente have a photographic department, your Honor, where they take photographs, and I got some of those——

Mr. Naus: Mr. Moore, there is no question but they are all true photographs, because I have been down there and seen it. I waive foundation, but I would like to know the dates.

The Witness: I might say that I personally have no knowledge of the taking of these photographs at all. I could only [174] judge by my knowledge of the date when the plant was under construction, when the construction was completed, and when it went into operation. I notice one photograph here

(Testimony of L. H. Duschak.)

has what I think is the date on it—2/25/44. It follows some identification numbers.

Mr. Moore: Let us take this one. We will have it marked. What is the next number?

The Clerk: Defendant's Exhibit B.

(The photograph was marked Defendant's Exhibit B in evidence.)

The Court: Q. You are prepared to testify that these photographs depict what they purport to show?

A. Yes, these are correct representations of the Natividad.

The Court: Is that satisfactory?

Mr. Naus: Yes, your Honor, but any depiction of the plat down there would be a different depiction each day. That is all I have in mind. I do not press or insist upon it. I would like to have it if convenient, that is all. I make no objection to the photographs being received.

Mr. Moore: I do not offer them for the purpose of showing the condition on any particular day, but a general depiction of the operations there.

Mr. Naus: If they are simply descriptive or illustrative of the plant, of course, there could be no objection, but if they depict any time, any month or year or anything of that sort, that is another matter. [175]

Mr. Moore: They do not purport to.

The Court: Q. About how many people are employed there? Do you know?

(Testimony of L. H. Duschak.)

A. I don't know exactly. Several dozen I should say, just by what I have seen.

Mr. Moore: We will offer these photographs in evidence and ask that they be marked with the appropriate mark.

The Court: Let them be admitted and marked.

(The photographs in question were received in evidence and marked Defendant's Exhibits C, D, E, F, and G, respectively.)

Mr. Moore: Q. Doctor, will you describe to his Honor the chemical reaction or process that takes place when this dolomite ore is crushed and then put into the kilns under this temperature?

A. Yes, the operation is a very simple one. The crushed dolomite is heated by an intensely hot flame.

Q. Can you give us approximately the heat that it is heated to?

A. Heated to a temperature of twelve or thirteen hundred centigrade; that for the purpose of decomposing the dolomite, driving out the carbon dioxide and leaving behind the so-called calcine dolomite, which consists of a mixture of calcium and magnesium oxides together with the small amounts of impurities present.

Q. What is left behind is magnesium oxide and calcium oxide, is that correct?

A. That is the main product of the kiln, the product which is sought in the operation, a mixture of calcium and magnesium oxide with a small amount of impurities.

(Testimony of L. H. Duschak.)

Q. What becomes of the carbon dioxide?

A. That carbon dioxide [176] which is expelled from the dolomite on heating, together with the carbon dioxide from the combustion of the carbonaceous materials and the fuel used, pass up the stack together with the nitrogen which accompanies the oxygen used in burning the fuel.

Q. In the course of this trial there has been reference to dust. That dust comes from what source?

A. That dust is picked up by the stream of hot gas flowing through the kiln.

Q. And it goes where?

A. And it is carried along by the gas stream out through the so-called kiln housing, and since the Cottress precipitator has been installed it passes through that; most of the dust is collected there. What is not collected passes on to the stack. A small amount will collect in the base of the stack, but a further small amount is carried up through the stack by the gas stream and discharged into the atmosphere.

Q. And what is that dust? What is its chemical composition as it is discharged into the atmosphere.

A. That is a somewhat difficult question to answer. That is to say, the only way in which a precise answer could be obtained would be by collecting a sample of this material just as it escapes from the stack.

Q. Pardon me. May I interrupt for a minute? Approximately how tall are the stacks?

(Testimony of L. H. Duschak.)

A. These stacks are approximately 200 feet tall.

Q. If you will proceed, please.

A. I have taken some samples at an elevation of about 100 feet, and I haven't with me at the moment the complete analyses of these samples, but I may say in general they will show the dust consists to a large extent of calcium and magnesium carbonate with a small amount of calcium and magnesium oxides and, of course, the traces of impurities.

I might explain further that this dust is material which is picked up throughout the length of each of the kilns. There are two kilns there. Their operation is in general identical. So that we will find the dust not consisting of a single material, but consisting of particles of entirely unchanged dolomite, the dolomite particles which have experienced slight calcination on the surface, and finally the particles which have been quite completely calcined. In other words, the dust, in a sense, represents a sort of average sample of the material which is in the kiln at any given time, ranging all the way from the raw material at the one end to the completely calcined material at the other. [178]

Q. You say you took samples about a hundred feet up the chimney?

A. About halfway up the stack.

Q. As that dust or gas, dust in gaseous form, passes up the chimney what chemical reaction takes places, if any, in your opinion, as it proceeds?

(Testimony of L. H. Duschak.)

A. The chemical decomposition process which took place in the kiln begins to reverse itself as soon as the dust particles are removed from the high temperature zone. Calcium carbonate cannot be decomposed. Below a temperature of 900°C . magnesium carbonate—which is a bright red heat. I might say—magnesium carbonate cannot be decomposed below a temperature of about 700°C . That is a moderate red heat. As soon as these calcine particles which contain magnesium carbonate and oxides pass to the point in the kiln where the temperature is below these levels, and in the presence of the kiln atmosphere containing both the carbon dioxide and the moisture, these oxide particles will begin to recombine with the carbon dioxide, and that process goes on progressively as the dust particles are carried through the flue system, up the stack, and continue out in the atmosphere.

Q. When they come into the atmosphere does their contact with the air also have some effect on the chemical characteristics of these dust particles?

A. This process of carbonation, as it might be called—that is, a conversion of the oxides into carbonates—it will go on continuously while the dust particles are in contact with the atmosphere, for the reason [179] that the atmosphere contains a small amount of carbon dioxide and also contains moisture, which tends to catalyze or speed up this reaction.

Q. Eventually these dust particles which were

(Testimony of L. H. Duschak.)

originally oxides are, through contact with the air and with the carbon dioxide therein, and water, H_2O , converted into what, Doctor?

A. They become converted into calcium and magnesium carbonates. That is, chemically they become the same as the original calcine dolomite.

Q. In other words, eventually they become the same as the dolomite that is mined out of the quarry, is that it? A. Yes.

The Court: Q. In its original state?

A. Not quite, because dolomite has a characteristic crystalline structure, and these little particles, when they are recarbonated, will not resume that crystal structure. There is that physical difference, but no chemical difference.

Mr. Moore: Q. Doctor, following up this process at the Natividad plant which you have described, after this dolomite has been put in the kilns and heated, resulting in I believe you said magnesium oxide and calcium oxide—that is correct, isn't it? A. Yes, that is correct.

Q. (continuing) —what is the next step in the process of making magnesium metal?

A. One plan consists in transferring this calcine dolomite to Moss Landing.

Mr. Naus: If the Court please, again are you interested [180] in anything after the operation ceased at Natividad? Do we need to go down to Moss Landing to find what dust came from the stack?

(Testimony of L. H. Duschak.)

Mr. Moore: No, but that is only one step in this operation.

Mr. Naus: While it would be an interesting thing for one to read in the evening——

The Court: What relation has any activity at Moss Landing?

Mr. Moore: There is an injunction relief asked here, your Honor, involving the war effort, the mining of this ore, and the calcine at Natividad is the initial step in the process in which there has been investment somewhere between 25 and 30 million dollars. It gives employment to a large number of people. It is a war effort, and we propose to prove under the direct authority of the War Department. It is a very definite matter connected with the proposed injunctive relief. It gives employment to a great many people. It has a part in the future industrial life of the western part of the United States. We propose to prove that this plant, which is the initial step—it follows three steps: one at Natividad, and then at Moss Landing, where it is mixed with sea water, and then to Permanente, which is outside of Saratoga or in that neighborhood,—that involves a process by which vital materials are being produced that are not only essential in war, to carry on the present war, but will become of vital importance in the future [181] industrial life of California. This material that is developed will be used in the manufacture of rayon, in the manufacture of steel, in the manufacture of synthetic rubber, in the manufac-

(Testimony of L. H. Duschak.)

ture of refractory bricks; that if we expect to have an industrial empire of the western part of the United States it is essential that this particular plant be not closed down by reason of Mr. Pista having 50 acres of apricots there.

The Court: I take it that counsel will stipulate with you on the statement you just made.

Mr. Naus: Not to the whole, but I will go this far: I really do not think that we need to study the chemical changes or transformations of dolomite down around Moss Landing. It is utterly unrelated to what he is talking about.

The Court: Unrelated to his injunction?

Mr. Naus: Yes. So far as the war effort is concerned, that is a function of the Federal Government, and I have yet to hear that the Federal Government is powerless, if it wishes to act on its own, to condemn apricot orchards or anything else it needs for that war effort. So far as the development of the West is concerned, I presume Mr. Pista and his family are just as much interested as these people in that question. But so far as the development of Butte, for example, and Anaconda, that development was not at the price of ruin to the farmers of the neighborhood. There were other ways of reaching that [182] which are still going on. The mere fact that someone wishes to do business on a large scale does not mean we have to destroy an orchard in the process. If the Secretary of War thinks this apricot orchard or the destruction of it is necessary to the war effort, all he has

(Testimony of L. H. Duschak.)

to do is file a declaration of taking in this court through Mr. Bourquin. There are ways of going about that.

Getting back to the objection, while I am delighted to listen to the dissertation of the doctor on the stand, I would rather sit around leisurely at home some evening, perhaps having a lemondade or something, and read it at leisure. I could pursue it there much better.

The Court: Going back to my first inquiry, in the interest of time I thought perhaps you would stipulate.

Mr. Naus: I will stipulate to this: that the end product of the process that begins up in that dolomite quarry on the hill at Natividad ends up in a metal that is used in the war, and undoubtedly vital to the war effort. How it goes, chemically and otherwise, to reach that stage, I do not know and I do not care about at this time.

Mr. Moore: I think we do care, and I think the Federal Government cares, and I believe everybody interested does care, whether Mr. Naus happens to care, and Mr. Pista, or not. We feel, your Honor, that this is one of those cases where there should be a full exploitation of the facts showing the justice [183] of a request for injunctive relief. Now, if Mr. Naus wants to stipulate and agree that he asks no injunctive relief, we are satisfied.

Mr. Naus: I will not stipulate to that.

Mr. Moore: What is that?

(Testimony of L. H. Duschak.)

Mr. Naus: I certainly will not stipulate to that. I told you at the beginning I was not going to take up the time of the Court on an application for a temporary injunction, with all that entailed, but I have never at any time surrendered the right to ask for an injunction on the final hearing, which we have now reached. We will not waive that.

Mr. Moore: I talked to Mr. Naus some time ago, your Honor, and I am in——

The Court: If you give me an opportunity here, I think I can be helpful. Counsel is entitled to a record when injunctive relief is asked.

Mr. Naus: Yes.

The Court: But I can't see any reason why in the interest of time counsel on both sides cannot get together and get a stipulation for the purpose of the record of the factual situation that you expect to prove. Is there any doubt about that?

Mr. Naus: I haven't any doubt after this product leaves, in whatever form it does leave Natividad, that it continues through a transformation until it finally reaches a form of metal vital and useful to the war, but what happens to it—[184] that is to say, how it is transformed after it leaves Natividad, the industrial processes, the changes, and the activities it goes through to reach that form of metal, I do not think that we need spend any time on in this case.

The Court: I suggest we go along and meet that situation. You counsel get together. If there is any question about it you may renew your offer.

(Testimony of L. H. Duschak.)

Mr. Moore: I would like to, your Honor. It is so hard and so difficult for me to even start to get a statement of facts, because I have only talked somewhat casually to people who are familiar with the many and varied uses that this metal and its by-products could be put to in the industrial life of America.

The Court: I do not think there is any question about it. I think you can get a stipulation as to that.

Mr. Moore: My position is I am willing to stipulate to everything I can think of with Dr. Duschak and other people dictating as to the uses it could be put to and the process there is involved here. There is involved, as I say, 20 or 30 million dollars. Your Honor asked how many people were employed there in the Natividad plant. Dr. Duschak said several dozen, but there are some 750 or a thousand employed elsewhere that are absolutely dependent upon this.

I realize in California the general rule of the State courts here has been the matter of the balance of convenience. [185] The balance of equities has not been applied, but it is a sort of an antiquated doctrine that has been disregarded and turned down by most of the States of the Union and by the Federal courts, and the matter of the balance of equities here as a war industry and a peace industry that is essential to the future of the West as against forty or fifty acres of apricots, we feel we should have a record here on that.

(Testimony of L. H. Duschak.)

The Court: There is no answer to that. You are entitled to a record, and you should have it.

Mr. Naus: We are both entitled to a record.

The Court: Counsel can see that, but I thought possibly the things you were seeking to prove here, you and counsel could get together and stipulate so far as you can, and on the matters you cannot agree on, develop that.

Mr. Naus: May I see that Defendant's Exhibit A, Mr. Welsh, for a moment?

If the Court please, I did not get a chance to read this until noon. It was not in my hands during the trial this morning. I think Exhibit A seems to give the whole story in a condensed form. The matter that he is seeking a prolixing or elaboration of through the witness is set forth here. I will stipulate everything said on this Exhibit A is true, and it seems to me that covers the whole story. What more could be added, I do not know, outside of words—words.

Mr. Moore: I am glad to accept the stipulation.

Mr. Naus: Pardon me?

Mr. Moore: We are glad to accept the stipulation. I would like to look it over and determine whether I want to add anything or not.

The Court: I will take an adjournment. We won't get through with this witness today. You and counsel get together and go as far as you can on any stipulation you wish to enter into.

Mr. Naus: I would invite your Honor's atten-

(Testimony of L. H. Duschak.)

tion over the recess to that, if you have an opportunity to look at it, to glance through the text, so that you will get the full effect and significance of the stipulation, and you will find I have covered everything that he is apparently attempting to cover in minute detail with the witness. It covers all the ultimate facts that he is reaching for.

The Court: We will take an adjournment until tomorrow morning at ten o'clock.

The Witness: I was about to remark that while counsel were arguing I could have told you the whole story and a little more.

The Court: I think so, too, but there are certain rules here we have to follow that even to experienced men like yourself it is hard to understand.

(Thereupon an adjournment was taken until tomorrow, Thursday, September 14, 1944, at 10:00 a.m.) [187]

Thursday, September 14, 1944

10:00 O'Clock A.M.

The Court: Pista vs. Permanente Metals Corporation.

Mr. Moore: Ready.

Mr. Naus: Ready.

Mr. Moore: Following your Honor's suggestion, Mr. Naus and I conferred and I think we are in perfect agreement that we cannot agree, so I might

state our position. That is a fundamental statement, is it not, Mr. Naus?

Mr. Naus: We ceratinly have not agreed. We have made no progress. As a matter of fact, I do not even know what specific facts they want me to agree to.

The Court: Legally, he is entitled to make a showing.

Mr. Naus: He is entitled to make a showing or an offer of proof, one or the other, depending on your ruling.

L. H. DUSCHAK,

recalled;

Direct Examination—(resumed)

Mr. Moore: Q. Doctor, I believe you stated that after the calcine process is completed at Natividad, the result is a product of MgO and $CaCO_3$, calcium oxide and magnesium oxide, is that correct?

A. Yes, sir.

Q. From your knowledge, what does this particular product look like, may I ask you?

A. It is a white granular material, chalky in appearance. [188]

Q. And what is done with that, may I ask you?

Mr. Naus: Objected to as immaterial, what is done with it after the process is completed at Natividad.

The Court: On the matter of injunctive relief he is entitled to make a showing.

Mr. Naus: I was merely making an objection for the record.

(Testimony of L. H. Duschak.)

Mr. Moore: I would stipulate that your objection runs to this entire line of examination.

Mr. Naus: If the Court wishes to accept such a stipulation, that is to say, I do not like to be popping up making objections right along; I simply take the position that after the product leaves that neighborhood where the apricot orchard is and goes down to Moss Landing, Saratoga, or elsewhere, questions with respect to such other processes are immaterial to the issues in this case.

The Court: It would be immaterial if it were not for the relief asked here.

Mr. Naus: I understand, if the Court please. So his Honor and counsel on both sides are in agreement that I have made the point and I will remain silent so as not to interrupt the trial.

The Court: Let the record show there is an objection running to this line of testimony.

The Witness: This calcine material is taken to Moss Landing, is mixed with water to form a slurry, and there added [189] in the correct proportion to purified sea water which has been pumped from the Monterey Bay. When this calcine material comes in contact with the sea water, various chemical reactions take place which result in the precipitation of magnesium hydroxide.

Mr. Moore: Q. May I ask you this: You are familiar with that operation there?

A. Yes, I am.

Q. Turning to Defendant's Exhibit A, which has been characterized as a flow sheet, or showing

(Testimony of L. H. Duschak.)

the process that has gone on, 1, 2, and 3 on there, the photographs, have been identified as the process at Natividad. Now, what are the photographs or pictures there that have to do with the Moss Landing part of the process?

A. Photograph No. 4 shows the large mains through which the sea water is brought into the Moss Landing plant.

Photograph 5 illustrates two hydro separators. That is a technical name for a tank which is used to separate solids from liquids. These hydro separators are used in connection with the purification of the sea water.

Photograph 6 is entitled, "Thickener tanks, Moss Landing." The one in the foreground is a very large tank in which this precipitation of magnesium hydroxide takes place. The other tanks shown in this photograph are used for the washing of this precipitate, that is, the separating of the soluble sea water constituents from the precipitate of magnesium oxide.

Photograph No. 7 is entitled, "Oliver filters, Moss Landing." This is a type of rotary vacuum filter which is used to recover [190] the magnesium hydroxide precipitate and also to permit its final washing, so that it becomes almost chemically pure magnesium hydroxide.

Photograph 8 illustrates a calcining kiln which is used for heating this precipitate of magnesium hydroxide to the point where the adhering moisture

(Testimony of L. H. Duschak.)

and also the chemically-combined water is driven off and a product of magnesium oxide obtained.

Photograph 9 shows a storage bin in which the calcined magnesium oxide is stored.

It might be mentioned that different temperatures are used in the calcining of this magnesium hydroxide precipitate, depending on the purpose for which the resulting oxide is to be used. In some cases a very high temperature is used and there is obtained a material known as periclase, which is employed in the manufacture of refractory brick, so-called basic refractories which are used in the steel industry. Otherwise, if the material is to be used at Permanente it is heated to a somewhat lower temperature.

Q. Are you then over the temperature?

A. I am still at Moss Landing. I am referring to the variety of products that would be obtained by the calcination of this magnesium hydroxide precipitate.

Q. May I ask you a question, if you will step over here on the blackboard again? Let us get the chemical process that takes place at Moss Landing. There is shipped from Natividad after [191] this calcine process which you described, Doctor, the product there. Will you kindly put on the blackboard what is shipped over from Natividad?

A. Yes. It is essentially MgO , magnesium oxide, and CaO , calcium oxide.

Q. Do you know how that is conveyed over from Natividad to Moss Landing?

(Testimony of L. H. Duschak.)

A. Yes, it is conveyed in large trucks.

Q. I think you did describe it, but if you will redescribe it, how does it appear?

A. It is a white granular material, a rather dull, chalky appearance. It looks not unlike this chalk that I am using for writing on the blackboard.

Q. When that arrives at Moss Landing what is done with it?

A. The first step is to deliver it into a stock bin.

Q. And then what is done?

A. Next is ground and mixed with a portion of the sea water in order to obtain what is known as a slurry to be used in adding this material to the large bulk of water from which the magnesium hydroxide is to be precipitated, or in.

Q. In other words, you mix this product with sea water?

A. That is correct.

Q. Will you give us the chemical analysis of the sea water that is used there, as nearly as you can?

A. The principal constituent of sea water is, of course, sodium chloride, common salt, but in addition there is present a small amount of potassium chloride, potassium sulphate, magnesium chloride, a small amount of calcium sulphate, and a number of minor constituents. [192] The thing that we are particularly interested in is the fact that the sea water contains several percent, something between 2 and 3 percent by weight of sodium chloride, and only a fraction of a percent of magnesium chloride. In other words, we are facing the problem of re-

(Testimony of L. H. Duschak.)

covering a minor constituent from a large volume of water.

Mr. Naus: I was going to say, Mr. Moore, I would accept the professor's statement as to the analysis of the sea water, because I am utterly ignorant on the subject, but I must admit that I am perfectly astonished not to hear him mention H_2O .

Mr. Moore: Q. May I ask you, there is H_2O in that combination?

A. Well, of course, the term "sea water" would imply to most people that there was water present; in other words, H_2O .

Q. Is the combination of sea water and the other constituents placed in settling tanks or some kind of tanks?

A. Yes. If I might, I would like to follow through the chemistry of this just a little bit. When these solids, the calcined dolomite, are brought in contact with the sea water—and the same thing would be true if they were brought in contact with any kind of water reasonably clean—a reaction takes place on this sense: Each of these oxides reacts in water, H_2O , to form a corresponding hydroxide. We have for the magnesium oxide, the magnesium hydroxide form, which has the formula $Mg(OH)_2$. Similarly, we have the calcium oxide reacting with water to form calcium hydroxide, $Ca(OH)_2$. Fortunately the magnesium hydroxide [193] is not very soluble with water, so it remains as a precipitate. Calcium hydroxide has an appreciable solubility in water, and it is this cal-

(Testimony of L. H. Duschak.)

cium hydroxide which is available for reacting with the magnesium chloride in the sea water. That chemical change may be expressed by this equation: MgCl_2 plus $\text{Ca}(\text{OH})_2$, will give us calcium chloride, CaCl_2 plus $\text{Mg}(\text{OH})_2$, magnesium hydroxide. The point I am developing is that in this magnesium hydroxide, which is the final product before calcination at Moss Landing, approximately half the magnesium hydroxide precipitated comes from the dolomite and the other half from the magnesium chloride in the sea water. So the calcined dolomite, if you like, serves two purposes: one as a reagent for recovering the magnesium hydroxide from the sea water, and the other as a direct source of magnesium hydroxide.

Q. I have certain photographs here, doctor, that I will ask you to identify if you can. Mr. Naus, I do not know what dates they were taken.

Mr. Naus: Except any photographs at Natividad, I haven't the slightest interest in them, so I won't take the time to look at them. Go ahead and make your record.

Mr. Moore: We offer this then as Defendant's Exhibit next in order.

(The photograph was marked Defendant's Exhibit H in evidence.)

Mr. Naus: Perhaps it would be better to give each one an exhibit letter and state in a word or two just what it is. [194]

(Testimony of L. H. Duschak.)

Mr. Moore: That is what I am going to do.

Q. Doctor, I call your attention to Exhibit H. Will you inform the Court just what that photograph illustrates?

A. This illustrates a number of the tanks, some of them technically known as hydroseparators, others as thickeners, in which this chemical process of bringing about a reaction between the sea water and the calcined slurry at Moss Landing is carried out.

Q. When the sea water and the calcined dolomite arrives there at Moss Landing they are combined and put in these tanks, is that correct?

A. Yes. However, the sea water is first purified by passing through another series of tanks. The tanks in which the sea water are purified are illustrated in this photograph.

Mr. Moore: I will ask that that be marked.

(The photograph was marked Defendant's Exhibit I in evidence.)

Mr. Moore: Q. That is the precipitate drawn from those tanks, is that correct?

A. Yes.

Q. It is put through a heating process?

A. Yes.

Q. And the photograph that I now display to you shows the kilns?

A. Yes. This photograph shows the kiln in which the precipitate is heated and the stack from which a large cloud of steam is escaping. That

(Testimony of L. H. Duschak.)

steam is steam that is driven out of the magnesium hydroxide and dehydrated. [195]

(The photograph was marked Defendant's Exhibit J in evidence.)

Q. In other words, as I understand, just to summarize, Doctor, the process at Moss Landing, the magnesium oxide and calcium oxide manufactured at Natividad is taken over there and mixed with sea water? A. Yes.

Q. And then from that there is a precipitate?

A. Yes.

Q. And that precipitate is then put through a kiln, is that correct? A. That is correct.

Q. Can you tell us approximately the heat that is used there at that kiln?

A. That temperature will vary depending upon the character of the magnesium oxide product which it is desired to produce. For use at Permanente a temperature of eleven to twelve hundred centigrade is adequate. If a so-called dead burnt magnesia, sometimes called dead burnt magnesite, is to be produced, also known as periclase, a higher temperature ranging up to fifteen or sixteen hundred centigrade will be used.

Q. May I ask you, Doctor, as a result of this process at Moss Landing, what is the chemical evidence that is derived?

A. The ultimate product obtained there is MgO , magnesium oxide. These different calcining temperatures do not in any way alter the chemical

(Testimony of L. H. Duschak.)

composition. They simply alter the physical characteristics of the material.

The Court: Without going into these details, wouldn't a general outline be sufficient for all purposes? [196]

Mr. Naus: I have not seen anything added to that Exhibit A so far.

Mr. Moore: I do not like to go too far, your Honor, but the only purpose of it is that eventually I want to show the uses to which this magnesium oxide can be put.

The Court: If counsel does not object we will accept the statement of the witness generally.

Mr. Naus: Subject to the general objection of materiality that I made.

The Court: In fact, if my memory serves me the witness indicated last night out of your hearing, while you were arguing the subject, he should cover the process in every detail.

Mr. Moore: I will accept your Honor's suggestion.

Q. Doctor, would you follow that through Permanente without my questioning you, and tell the Court what occurs through that process?

A. For the purpose of manufacturing metallic magnesium by the carbo-thermic process magnesium oxide is the source of magnesium. The chemistry of this process at Permanente is exceedingly simple. The magnesium oxide is mixed with the correct proportion of white pure carbon, formed into little briquettes and fed into an electric furnace which

(Testimony of L. H. Duschak.)

operates at a temperature of twenty-two to twenty-three hundred centigrade. In that furnace a reaction takes place between the magnesium oxide and carbon, which are both solids, even at this very high temperature, forming magnesium metal vapor [197] and carbon monoxide. This magnesium metal vapor, which is a gas at this high temperature, and the carbon monoxide escape together from this electric furnace and are shock-cooled by injecting a large quantity of cold natural gas. The purpose of the shock-cooling is to prevent this reaction which I have just written from reversing itself, that is, to prevent the carbon monoxide from reacting with the metallic magnesium vapor and again forming magnesium oxide and carbon. Unless these gases are cooled with extreme rapidity that reaction will reverse itself and we will obtain no metallic magnesium.

By this shock-cooking the magnesium metal is precipitated from the form of a gas into a very finely divided solid. This solid is collected by filtering through asbestos bag filters, and then after a certain preparation that may be transferred to a retort in which the magnesium metal is distilled in order to obtain the highly pure magnesium metal from the crude product.

I have mentioned that this first precipitated material obtained by the shock will contain some impurities. I think it might be also mentioned—it is no longer a closely-kept secret—that this precipitated magnesium metal, which is in a state of ex-

(Testimony of L. H. Duschak.)

remely fine division, has been found exceedingly useful in preparing certain missiles, and a very considerable proportion of the Permanente output, instead of being converted into a solid metal, has been used in preparing some very useful war materials. [198]

Q. May I ask you, Doctor, would it be possible to make the metal magnesium or magnesium oxide that you have referred to at Moss Landing and through Permanente if the process at Salinas were shut down?

A. There are other ways in which magnesium oxide could be obtained for purposes of the Permanente operation.

Q. Will you explain what they might be?

A. One possibility would be to mine magnesite, and it so happens that, so far as I know, the nearest magnesite is over in Nevada. The magnesite would have to be mined. It would have to be put through a milling operation to purify it, and then it would have to be shipped down to Permanente and calcined, and after all that had been done the magnesium oxide would be much less pure than that obtained from Moss Landing, so that the whole carbo-thermic process would not work so well. Its efficiency would be considerably reduced.

Q. Does the carbo-thermic process that is constituted by the Natividad operation, the Moss Landing and Permanente operations, in your opinion, produce a product that has any unusual characteristics?

(Testimony of L. H. Duschak.)

A. Yes. This first crude magnesium oxide dust or powder which is obtained by the shock-cooling is a very unique material. It contains particles of magnesium finer than can be obtained in any other way, and in a particularly reactive form.

Q. Why is that useful or valuable?

A. Because of the speed with which it will burn in contact with the air or enter into [199] other reactions.

Q. Do you know what use to which the products of the Natividad operation, the Moss Landing operation, and the Permanente operation are being put?

A. I know that some of the magnesium is being used in preparing special types of incendiary bombs which are being prepared, I have been told, for use in the Pacific area.

Q. By "Pacific area," you mean the Pacific war area? A. Yes.

Q. Is magnesium used in airplane manufacture, at all? Do you know that?

A. Yes, metallic magnesium is used to a limited extent in the construction of airplanes, and there is a very persistent effort to increase the amount which is used because of its greater lightness as compared with aluminum.

Q. Greater what?

A. Greater lightness, a lower specific gravity.

Q. Do you know of your own knowledge what percentage or proportion of the products of these plants are being devoted to the war uses today?

A. No, I couldn't say.

(Testimony of L. H. Duschak.)

The Court: Q. Approximately, just in general?

A. All of them, so far as I know.

Mr. Moore: Q. So far as you know, everything that is being produced is being used in the war effort today by the Government, is that correct?

A. Yes.

Q. Doctor, are you familiar with the construction of the Natividad plant? A. Yes.

Q. You made a study of the dust problems there at the time of [200] its construction, did you?

A. No, not at the time that the plant was being designed and constructed. I had some little discussion on that subject, but I was not really asked to go into the dust problem until the plant had been operating for a number of months and a complaint had been received by the plant superintendent from one of the neighbors.

Q. You were called in then on an advisory capacity on that subject, is that correct?

A. Yes, I was asked to go to Natividad and examine the whole operation, the whole situation there, and advise the Permanente Metals Company what should be done, if anything.

The Court: Q. Can you give the date, approximately?

A. It was in November, 1942.

Mr. Moore: Q. When was the plant constructed there?

A. The plant was under construction in the summer of 1942. I worked on certain features of the design during the month of May. I can't state

(Testimony of L. H. Duschak.)

just when it went into operation, but it was sometime between, let us say, the 1st of June and the 1st of October.

Q. And when were you called in on this matter of dust?

A. I can give you the exact date from some notes I made for my records. On November 11, 1942 I visited the Natividad plant for the purpose of going into this dust question.

Mr. Naus: That does not quite answer the question. You asked when he was called upon. He told when he went there. [201]

Mr. Moore: Q. You visited the plant immediately after you were called upon, is that correct?

A. Within a few days, yes.

Q. You made a study and examination *at time*, did you? A. I did, yes.

Q. Will you relate to the Court just what you did?

A. I had not previously seen the plant in operation, so I went through the plant quickly to see in the flesh what I had seen in the drawings, and then with Mr. Garoot, the plant superintendent——

Q. Pardon me for interrupting. Who is Mr. Garoot? Will you tell his Honor who Mr. Garoot is?

A. Mr. Garoot is the superintendent in charge of the Moss Landing and the Natividad operations, an employee of the Permanente corporation. Mr. Garoot took me to visit the Anderson ranch, which is just across the road from the Natividad plant, and then together we went along the Gabilan creek road,

(Testimony of L. H. Duschak.)

pausing now and then to examine vegetation for the presence of dust. We made a number of side excursions on side roads. The general purpose of this trip was to determine the region within which the dust was falling and the extent of the dust fall.

Q. Will you continue and tell us what you did or what occurred?

A. I found that the quantity of dust falling on the Anderson place at that time, and particularly on their vegetable garden, which is close to the house and close to the road, was quite considerable, and I was in full accord with the statement which [202] Mrs. Anderson made to me that certain products of the garden, such as blackberries, raspberries and some other things, were practically unusable because of the quantity of dust that was present on them at that time.

Q. That was in November, 1942, is that correct?

A. That is correct.

Q. Did you examine the Pista ranch at that time?

A. No, I did not go within the gates of the Pista ranch. We drove by it. I remember stopping in the vicinity and looking at the dust deposits on some weeds and other vegetation in the general vicinity.

Q. Will you state as clearly as you can to his Honor just what your observations were?

A. My observation was that there was a very noticeable deposit of dust on the foliage within a mile or two of the plant. I traced that dustfall to a distance of a little over three miles. At that point it

(Testimony of L. H. Duschak.)

was so unappreciable as to be very difficult to recognize. I examined the dust deposit that I observed on foliage at various points and noted a very considerable number of little sparkling particles which were clearly the uncalcined, that is, the raw dolomite.

Q. In other words, merely by visual observation of them you could determine their character, is that correct?

A. Yes, I could determine that many of the particles on the leaves were just raw dolomite dust.

Q. What was your observation as to the balance of the deposit [203] that was on there?

A. The remaining particles were of a dull appearance instead of showing the clear translucence of the dolomite particles and were obviously either partially calcined or completely calcined particles of dolomite.

Q. You made no analysis of that dust at that time, did you?

A. No, I made no attempt to collect any samples or make any analysis.

Q. I mean laboratory analysis? A. No.

Q. What you are stating is merely from your knowledge and your observation? A. Yes.

Q. There has been produced in evidence here, Doctor, an exhibit by Mr. Twining. I think you have had the opportunity of looking this over. I will call your attention to Plaintiff's Exhibit 6, which shows his analysis of various deposits. No.

(Testimony of L. H. Duschak.)

1, 2, 3, and 4, on oak leaves, and so forth. You have looked that over, have you? A. Yes, I have.

Q. Referring now not to any of the conclusions but solely to page 3, I will ask you, from your general observation of the character of the dust that you saw, whether in your opinion that is a proper analysis of that dust?

A. I would say that the analysis reported here shows a composition exactly what I would expect would be found on vegetation.

Q. In other words, from your visual observation of the dust as compared with Mr. Twining's laboratory analysis of it, it would be your view that that is a correct presentation of the character [204] of that dust, is that correct?

A. From my visual observation of the dust, plus my knowledge of mechanical characteristics of the materials that you are dealing with, I would say that this appears in every way to be a reasonable analysis of the deposit on the vegetation.

Q. Doctor, this states, if I might term it such, the mineral characteristics of this dust as consisting of calcium carbonate, magnesium carbonate, silica, and iron aluminum. Is calcium carbonate caustic in any way? A. No, sir, it is not.

Q. Is magnesium carbonate caustic?

A. No, sir.

Q. Is silica caustic? A. No, sir.

Q. And are iron and aluminum caustic?

A. No, sir.

(Testimony of L. H. Duschak.)

Q. Will you tell his Honor what you mean by saying that these particular elements are not caustic?

A. The word "caustic" is used in a particular sense in chemistry as describing certain oxides or hydroxides. We refer, for example, to calcium oxide as caustic lime, although that is not very good usage. That particular terminology in chemistry comes from the basic meaning of the word "caustic," which is something which bites or destroys or corrodes, and we apply it to certain materials, such as lime, such as sodium hydroxide, also known as caustic soda, because these materials, when applied in the form of a moderately strong solution to animal or vegetable matter will more or less destroy or corrode the vegetable matter. On the other hand a substance like calcium carbonate [205] is not caustic. Calcium carbonate is something that we know in tooth powder as precipitated chalk. It is one of the common constituents of tooth powder, neutral, inoffensive, relatively inactive material, and much the same thing can be said of magnesium carbonate.

Q. Let me ask you relative to the fertilization of plants, and particularly orchards, have you had occasion to more or less make a study of the effect on pollinization of various types of alkalis and acids or that sort of thing?

A. Yes, I have made some study of the processes involved in pollinization and of the chemical circumstances which may affect that process.

(Testimony of L. H. Duschak.)

Q. Will you kindly tell his Honor just what studies you have made?

A. Well, these studies have been in part the reading of articles in scientific literature and in part they go back to my school days, work that I had in botany and biology, and in part discussions with men on the University of California faculty, plant physiologists, pathologists, and so on. I think of Dr. DeOng, former professor of the University of California. I discussed quite fully with him one time this process to be sure my understanding and my reading was correct. I could mention others. I have also read some court records. I can think of a case a good many years ago when the question of the effect of dust on vegetation was considered, and in which testimony was offered by the various experts.

Q. From your knowledge of chemistry and your knowledge of plant [206] growth and the discussions you have had, in your opinion would calcium carbonate, as described to you by Mr. Twining, in any way have any effect on pollinization?

Mr. Naus: One moment, if the Court please. I would like to ask a question or two on voir dire with respect to his qualifications.

Q. You said something about what you remembered from your school days helped you in your studies of pollinization? A. Yes, sir.

Q. And then you read some things. I believe you mentioned a court record or two. Where was that? A court record where, and about what?

(Testimony of L. H. Duschak.)

A. That was a court record of a case in Southern California, the Riverside case.

Q. The Riverside Portland Cement Company, is it? A. That is right.

Q. Do you recall that was the record of a case that went to the Appellate Court and was decided in favor of the landowner?

A. Well, I do not recall the legal details. I know that the Riverside Company installed a Cottrell precipitator at that plant.

Q. I am trying to find if this case you read and upon which you base your ability to form your opinion was a case that can be identified in the Appellate Court Reports. I would like to know what year that litigation was.

A. I will be unable to answer your question in just that form because the record of [207] that case is only a minor item in connection with the reading.

Q. Regardless whether it is minor or major, you mentioned it, so I would like to know something about it. I am trying to get the identity of the litigation, the court record. Do you know what was the year of the litigation, or the year of the falling of the dust?

A. It was prior to 1913. I can't fix the date more accurately than that.

Q. When did you read it?

A. I read it, I think, about ten or twelve years ago in part. I did not read the entire record.

Q. Then you did not participate in the litigation, yourself, did you? A. No, sir, I did not.

(Testimony of L. H. Duschak.)

Q. Just from reading as a matter of interest in a particular field; was that it? A. Yes.

Q. Was it a typewritten record or a printed record? A. It was a typewritten record.

Q. Where did you read it?

A. I read it in the office of the Western Precipitation Corporation in Los Angeles.

Q. Outside of that court record, and outside of what you remembered from your school days, what literature have you read?

A. Oh, I have read a number of publications of the California Department of Agriculture, their agriculture extension service.

Q. Identify them, please.

A. I am not sure that I can begin to mention them now. They have to do with the growth of various fruits with the use of insecticides, with the pests affecting vegetables and fruits in California.

Q. Now, that is the Department of Agriculture of California, is it?

A. Yes, these are publications which are put out by the Agricultural Extension Service of the Department of Agriculture of the University of California in cooperation with the Federal Government. I have also read various publications of the Federal Department of Agriculture dealing with plant diseases, pest control, insecticides, and the various stages of the growth of vegetables, fruits, et cetera.

Q. Of all the publications you have mentioned as having read from either the California source or the Federal source, give me the name of the author

(Testimony of L. H. Duschak.)

and title of any one having to do with the effect of dust falling on blossoms, if you can.

A. I do not recall that any of those publications mentions specifically the effect of dust falling on blossoms.

Q. You say those publications. I am only asking you about the name of the author and the title of any publication that has to do with the effect of dust falling upon blossoms. Was there any?

A. Yes.

Q. From those sources? A. No.

Q. Then you have not named a single publication so far, outside of the court record, that has to do with the effect of dust falling on blossoms, have you?

Mr. Moore: I do not like to object, your Honor, but I think this is really cross-examination.

Mr. Naus: On the voir dire. [209]

The Witness: I would like to say this court record said nothing, as I recall, about the effect of dust falling on blossoms. They simply discussed the effect of dust falling on foliage, that was the aspect in which I was interested, and I do not recall that there was anything in this Riverside record about the effect of dust on blossoms. There may have been, but I do not recall. [209a]

Q. That Riverside case had to do with dust falling on an orange grove or groves?

A. I believe so.

Q. In the course of your reading, and outside of the sources of these publications you have men-

(Testimony of L. H. Duschak.)

tioned, what monograph or article, book or literature have you read with respect to the effect of dust falling on blossoms?

A. I have read a photostatic copy of an article that emanated from some work at Cornell University a number of years ago. I can't give you from memory the authors or the title of that article, but I could produce it.

Q. Could you produce it at two o'clock?

A. Yes.

Q. Thank you. I would be glad if you would. Is there any other that you read that bore on that subject of dust falling on blossoms?

A. Some of these University of California Department of Agriculture publications came very close to that, since they discuss the use of Bordeaux mixture in controlling such things as brown rot on apricots and make some reference to the possibility that this Bordeaux mixture might interfere with the process of pollinization.

Q. Did they say that it did, or is that merely conjectural?

A. My best recollection of the statements is that it might be if it entered the blossoms before pollinization had occurred, and there is a general advice, which I think one finds in a number of these publications, that it is better to use Bordeaux before the blossoms are fully opened, and only in extreme cases [210] where a bad brown rot condition is believed to exist, and where rather severe measures are needed for its control, that Bordeaux

(Testimony of L. H. Duschak.)

spraying should be practiced during the time when the apricots are in full bloom. In other words, the advice in general is to spray before blossoms are fully open and then just after the blooming period.

Q. Have you ever made any experiments or tests to determine the scientific truth or one way or the other about it?

A. You refer to the studies?

Q. No, I am speaking to you personally, as to whether you as a scientist have ever made any experiments or tests of Bordeaux mixture on blossoms to determine the truth one way or the other of what these publications say might have happened.

A. No.

Q. Aside from any publication that you mentioned so far, and the only one specifically I recall——

Mr. Moore: I do not like to object, your Honor, but this is cross-examination. He has not permitted me to finish. The question is whether this witness is qualified as an expert——

Mr. Naus: If the Court please, he has been asked for an expert opinion. I am still on voir dire to see if he is qualified to give one. I haven't gone as far as I intended to, unless the Court stops me.

Mr. Moore: I have not gone into Bordeaux mixture or anything. But I will let Mr. Naus cross-examine the witness and then take up his direct examination. [211]

The Court: You will have an opportunity to

(Testimony of L. H. Duschak.)

cross-examine him. He is already qualified as an expert.

Mr. Naus: Then, if the Court please, he is qualified in chemistry generally and metallurgy, but I do not think he has given any qualifications at all with respect to the effect of the falling of dust on vegetation or on blossoms, and I object to the question that is pending that was put by Mr. Moore, on the ground that it calls for an opinion upon a subject and in a field, a narrow field, upon which the witness has not shown himself to be qualified.

The Court: You had better reframe the question. I see we have a change of reporters. [212]

Mr. Naus: In the first place, is your Honor sustaining the objection to my continuing to cross-examine the witness on the stand with respect to whether or not he is qualified?

The Court: Don't you think you have gone into that fully?

Mr. Naus: No, I don't, if the Court please.

The Court: Well, I might say, as I usually do in my frank way, we have made very little headway in this case; that it does seem to me that we are losing some considerable time. I am willing that both sides have a full record so that when I do the best I can with it, that it can be taken elsewhere so that you may deal with it accordingly. But there is no doubt in my mind that this witness is qualified. Now, then, on cross-examination you may search his weaknesses and bring them out in bold relief.

(Testimony of L. H. Duschak.)

Mr. Naus: Well, then, there are two matters awaiting a ruling, apparently: Mr. Moore's objection to my asking any further questions on voir dire, and my objection as against his qualification as a supposed expert because of his brief experience in the particular field that he put him on for.

The Court: Then I will declare there is nothing before the Court. Reframe your question and I will rule. Proceed.

Mr. Naus: Which one of us shall proceed?

The Court: Either one.

Mr. Naus: Then I haven't discontinued the voir dire yet.

The Court: Proceed. [213]

Mr. Naus: Q. Doctor, outside of the photostat of a report that you mentioned that you had expected to bring here at two o'clock, can you give me the title or the name of the author of any other monograph or book or study—published study—bearing upon the subject of the effect of the falling of dust on blossoms?

A. No, I can't recall any author or title offhand.

Q. Have you personally ever made or conducted any experiment or test with respect to the question of pollinization or fertilization upon the falling of dust or dropping of dust on blossoms?

A. No, I have never personally conducted experiments on that subject.

Q. You have never at any time put any Bordeaux mixture or any dust such as comes from Permanente or any road dust or cement dust or

(Testimony of L. H. Duschak.)

anything on blossoms in different quantities to see the effect it would have with respect to pollinization, have you?

A. I have put Bordeaux mixture on the blossoms, but not for the particular purpose.

Mr. Naus: Not for that study.

That is all on the voir dire, if the Court please.

The Court: Proceed.

Mr. Moore: Q. Now, Doctor, let me ask you, in your opinion, is calcium carbonate caustic?

A. No.

Q. In your opinion, is magnesium carbonate caustic? A. No.

Mr. Naus: If the Court please, that has been asked [214] three or four times of this witness.

Mr. Moore: I know, but you have spent a half hour with your questioning, and I have lost track, and we have got a new reporter here. I may be repeating. I apologize.

The Court: All right; proceed.

Mr. Moore: Q. Is silica caustic?

A. No.

Q. How about iron and alumina—are they caustic? A. No.

Q. Now we come to the matter of pollinization. Can you tell us, from your studies, in a general way what is the chemical reaction of pollinization—I mean, acid and alkali and all that? What is the process that takes place when pollinization occurs?

Mr. Naus: Objected to as calling for an opinion

(Testimony of L. H. Duschak.)

in a field in which the witness has not shown himself to be qualified.

The Court: If he knows, he may answer. Do you know?

The Witness: Yes.

The Court: Proceed.

A. The process of pollinization involves the transfer of particles of pollen from a mature anther to the stigma, which is the top of the pistil, which is connected to the so-called ovary of the blossom—in this case to the little apricot. At the time when the blossom is right for pollinization, this stigma has a thin coating of a somewhat sticky fluid.

Mr. Moore: Q. What is it termed?

A. That is a [215] provision of nature to permit the pollen when it drops on the stigma to adhere there. This fluid has a slightly acid reaction, and there are experiments to show that if an alkaline material is applied to this stigma at just this critical time in sufficient quantity to neutralize this acid coating on the stigma, it will interfere with the germination of the pollen, and hence with the pollinization of the ovary,—in this case the microscopic apricot.

Q. In case the element or dust, or call it what you will, that is put on there is alkaline or neutral, or the reverse, we will say acid, will you describe from your studies and from your knowledge, as near as you can, what effects these various characteristics of dust might have on the pollinization?

(Testimony of L. H. Duschak.)

Mr. Naus: The same objection.

The Court: He may answer if he knows.

A. We will have to take up the three cases separately, but point out, however, in regard to the three cases that you have mentioned that we have to be quantitative about it; in the matter of a perfectly neutral dust, such as road dust, for example, it is conceivable that sufficient road dust might coat this surface of the stigma so as to give it a protective armor which would prevent contact with the pollen. Secondly, we will speak of acid. The addition of a minute amount of acid would probably have no effect; but if the quantity of acid added to the stigma was sufficient to materially alter the chemical [216] composition of this fluid, I would expect it to interfere with the fertilization.

And similarly in this case of alkali, if a very tiny amount of alkaline material were to land on the stigma, it might or might not be sufficient to neutralize all of the acidity of this fluid and interfere with pollinization. If a large quantity of caustic alkali landed on the stigma, it would undoubtedly prevent the development of the pollen.

There should be a further point made there, however: that many blossoms—many flowers are more or less self-pollinating; that is to say, the structure of the flower and its mode of development is such that pollen from the anthers on the stamens of an individual flower can come in contact with the stigma of that flower even before the petals have expanded enough to expose this internal structure

(Testimony of L. H. Duschak.)

to the outside air. Now, that happens to be true in the case of the apricot; so-called self-pollinization can take place there. After the blossom has opened it is entirely possible for the pollen grains from other blossoms to drop in there or to be carried by the breeze or to be carried in by insects. So that I believe that the best opinion is that both cross-pollinization and self-pollinization take place in the case of the apricot.

Mr. Moore: Q. Let me ask you: You have referred to both acids and neutrals and alkalis. Let me get it clear. In the case of neutral dust, if we may use that term, what effect, in your opinion, [217] does that have on pollinization?

A. No chemical effect whatsoever. The only possible effect is by physical interference with the process.

Q. Now, are calcium carbonates and magnesium carbonates acid, alkali or neutral? What are their characteristics?

A. They are neutral salts. They are salts of carbonic acid.

Q. May I ask you, Is it a fact that these very same constituents are in practically all soils?

A. They are very common constituents of soils.

Q. That is, I mean calcium carbonate.

A. Particularly calcium carbonate.

Q. And magnesium carbonate?

A. Yes, that also.

(Testimony of L. H. Duschak.)

Q. Did you visit the Pista ranch about the time of pollinization in 1943? A. No, I did not.

Q. So you have no knowledge of the amount or volume of dust that was being deposited at that time? A. No, I do not.

Q. You did visit it in the fall of '42, did you, or was it the Anderson ranch?

A. I passed by it and stopped near it in the fall of 1942.

Q. But you didn't make any observations?

A. As of the Pista ranch, no.

Q. Have you ever made any particular observations relative to the amount of dust that was deposited on the Pista ranch?

A. Well, I visited it this spring and made some observations then. [218]

Q. By this spring you mean 1944?

A. The spring of 1944.

Q. But in '43 you made no observations whatsoever, is that true?

A. If I may, I would like to refer to notes here, as I think that I did visit it in December '43. (Referring to notes.) Yes, in December of 1943 I visited the Pista ranch in company with Mr. Packard.

Q. That was the first time you had visited that ranch? A. That is right.

Q. Prior to that time as to the amount or volume of dust that might have been deposited there you have no personal knowledge? A. No.

(Testimony of L. H. Duschak.)

Q. Now, Doctor, turning to another subject. I believe you testified that in December of 1942, if I am not in error, you were called in by the Permanente people relative to the dust problem down there, is that correct?

A. That was in November 1942.

Q. November of '42. And then will you relate to the Court what occurred thereafter relative to this dust problem so far as the studies that you made and so far as the efforts to stop or minimize the dust situation.

A. In brief, I made a report to the company about the middle of November in which I advised that, in my opinion, the quantity of dust——

Mr. Naus: Just a moment. Now, if the Court please, if that report is in writing I ask that the writing be produced.

Mr. Moore: Q. Have you a copy of that? [219]

The Court: Q. Have you the report available?

Mr. Naus: The witness has no right to tell us what is in writing.

A. I haven't it here. I can produce it from my files.

Mr. Naus: I think the report ought to speak for itself, whatever report to the company he made, if it was in writing. I object to the witness testifying.

The Court: He asks for the writing. It is the best evidence.

Mr. Naus: Yes; it is presumed they should have an original or the witness should have a copy.

(Testimony of L. H. Duschak.)

The Witness: If your Honor please, the thing is very simple; it can be stated in a few words.

Mr. Naus: I don't care how simple it is.

The Court: Again I call your attention to the rules.

The Witness: The rules, yes.

The Court: You bring me into a field and I get submerged in your field of chemistry. I can well understand how you can get submerged in this legal field.

Mr. Naus: If the Court please, at this time I demand from both the witness and counsel the production of that report.

Mr. Moore: We will produce it. You don't need to make a demand, Mr. Naus.

The Court: Proceed. [220]

Mr. Moore: Q. Without attempting to relate what you said in that report, Doctor, will you tell the Court what occurred in this matter in relation to this dust problem, what happened down there at Natividad.

A. As a result of my recommendations, steps were taken to put in dust-collecting equipment at Natividad.

The Court: Q. Give us the result. Go through and tell us the whole story. Probably that will save some time. What happened?

A. The Permanente Company decided to put in a so-called Cottrell precipitator.

Mr. Moore: Q. May I interrupt you just a

(Testimony of L. H. Duschak.)

moment? Will you describe to his Honor what a Cottrell precipitator is.

A. The Cotterell precipitator is a device for separating, by the use of electrostatic forces, particles of solids or liquids which are in suspension in a gas stream. It is a device that is widely used by smelters and cement plants and other industrial plants to collect dust or liquid particles which are in suspension in gas, such as the stack gas from a kiln. The Permanente Company communicated with the Western Precipitation Corporation in Los Angeles, who furnished this device in this territory, and obtained designs and presently constructed precipitators on the two kilns there at Natividad and put them in operation.

Q. Now, will you kindly explain in a very brief way how this precipitator works. You said, I think, by electrolysis or [221] electric—or the use of electrical forces.

A. If I may step to the blackboard I can illustrate the process very simply.

The Court: Very well.

A. What I am about to present is more of a diagram than anything purporting to resemble a working drawing of the apparatus. If we may imagine a circular pipe that is, say, 10 or 12 inches in diameter, and 6 or 8 feet long; and if we have suspended down in the center of that pipe a small wire with a weight attached to the bottom so that it will hang vertically, we have the elements of the precipitator itself. Now, in addition to that we

(Testimony of L. H. Duschak.)

have certain electrical equipment which will furnish a very high voltage unidirectional current, a current of say 4250 to 60,000 volts. The negative pole of this generator of this unidirectional current is connected to this central wire. The pipe—large pipe—is grounded; that is to say, a connection is made to earth, usually a system of water pipes. The dust suspended in the gas stream is passed up through this pipe from bottom to top. The voltage is so adjusted that a corona discharge, a so-called silent discharge of electricity takes place from this central wire electrode. That discharge consists of electrons, negative particles of electricity. They attach themselves to not only the gas molecules but also to the suspended particles of dust or liquid, and then by virtue of the electrostatic field—we have a central wire [222] charged with negative high voltage; we have the pipe neutral or grounded, and we have a potential drop anywhere from forty or fifty or sixty thousand volts between the wire and the pipe creating an intense electrostatic field. The negatively charged particle in that field is repelled by the wire and moved by electrostatic forces from the electrode to the pipe, so that the practical result of the operation is to deposit on the pipe the particles which were in suspension in the dust stream. The practical application of this idea involves a system for diverting gas from one section of the precipitator to another at a time for a few moments in order to allow it to be rapped for the

(Testimony of L. H. Duschak.)

purpose of jarring loose the dust deposit which has formed on the surface.

Mr. Moore: Q. Doctor, I am going to phrase this question in very unscientific terms to try to get a picture for all of us of this dust catcher or precipitator. Fundamentally it is of the nature of a magnet which is charged positively and the dust is charged negatively, so the dust, by reason of the electric current, goes over and settles on these magnets. I know you don't like the term "magnet," but will you just explain in a very few words, without detail, that electrical——

Mr. Naus: If the Court please, hasn't he just finished explaining it?

Mr. Moore: I thought it would be very simple if you just got a brief explanation so that we could get the idea. [223]

Mr. Naus: I seems to me the explanation is simple; anybody can follow it.

The Court: Q. Is there anything that you can add to what you have already said in relation to that?

A. I think not. I think I have covered it.

Mr. Naus: I think so.

Mr. Moore: Q. When was this process instituted there up in Natividad? When was it put into effect?

A. It was during the summer of 1943. I have no exact dates, because I had no immediate connection with the installation of that equipment.

(Testimony of L. H. Duschak.)

Q. You were familiar with this particular Cottrell process, were you?

A. Very familiar with it.

Q. Will you explain to the Court how you happened to be familiar with that process?

Mr. Naus: Objected to as immaterial how he ever got familiar with it.

Mr. Moore: I think it is proper, your Honor.

Mr. Naus: He has described the process. He has said it was installed, and what involutions or evolutions he ever went through to finally discover or learn something, it seems to me is utterly immaterial.

The Court: I will sustain the objection.

Mr. Moore: Q. In your opinion, Doctor, is the Cottrell process, that precipitating process that you have described, equal to other processes of catching duct or superior to them [224] or inferior to them?

A. I can best answer that by saying it is a process which is very widely used in industry when a dust-collecting problem arises, and it is one of the best processes, and in many cases the best process, that can be employed.

Q. Any time you have a problem of dust and the matter of installing a dust catcher or precipitator, or whatever term you want to use, it is a matter of study, isn't it, as to what process and how it will work?

A. Yes, very much so.

Q. Will you explain to his Honor what you mean by that answer?

(Testimony of L. H. Duschak.)

Mr. Naus: Isn't the answer self-explanatory, that he has to study each individual case?

Mr. Moore: No, I think it is subject to explanation.

Mr. Naus: I object to it as asking a repetitious question.

Mr. Moore: There is no repetition there.

The Court: You may answer the question at this time briefly.

A. We have to consider the character and quantity of dust and the chemical and physical characteristics of the dust, including the size of the dust particles. We have to consider the kind of gas in which the dust is being carried and the temperature of the gas.

Mr. Moore: Q. In other words, each plant that installed has to meet the peculiar conditions of that particular problem, is that correct?

A. Yes. The Cottrell equipment [225] is not a standard equipment like a vacuum cleaner which one can buy at a hardware store.

Q. In other words, it has to be adapted to the particular problem, is that correct? A. Yes.

Q. In the installation at Natividad were there certain problems there that had to be met?

A. There were.

Q. Were you called in as a consultant with regard to those problems?

A. Yes, I was consulted to some extent in connection with the plans for designing the precipitator.

(Testimony of L. H. Duschak.)

Q. And after that precipitator was installed were you also consulted in regard to its operation?

A. To a slight extent. However, the Western Precipitation Corporation are the ones who installed it and who were responsible for showing the company how to operate it and how to overcome operating difficulties which were encountered.

Q. I can introduce it from other sources, but I might ask this question: Doctor, do you know approximately what the installation of that precipitator cost?

Mr. Naus: Objected to as immaterial.

Mr. Moore: I think it is highly important, your Honor.

The Court: He may answer, if he knows.

A. My recollection is that it cost something like \$160,000.

Mr. Moore: Q. Now, will you describe the problems that had to be met there and how this operated and what was done from the time it was initially put in up to the present time? [226]

Mr. Naus: If he knows.

Mr. Moore: If you know.

Mr. Naus: I think he has already answered rather indicating that he doesn't.

The Court: Q. Do you know?

A. I can mention some things. Shortly after the precipitator had been put in operation certain irregularities in its performance were discovered or recognized. Engineers of the Western Pre-

(Testimony of L. H. Duschak.)

precipitation Company were sent for to make a study of that situation, and they presently discovered that in order to work at its best efficiency the temperature of the gas entering the precipitator had to be held within certain limits. When there was a change from natural gas to fuel oil for heating the kilns——

Mr. Moore: Q. May I interrupt just a minute? You say when there was a change from natural gas to fuel oil. What was that situation, if you know?

Mr. Naus: If the Court please, I object to two questions pending at once. Apparently the answer to the previous question is incomplete, and now another complete question is framed in the middle of it.

Mr. Moore: I admit that I am interrupting.

Mr. Naus: I think it would be better for the first answer to be complete, then it would be followed by any things he wants to bring out; otherwise we will have confusion.

Mr. Moore: I will withdraw the question, Mr. Naus, and [227] let the witness proceed.

The Court: You were speaking of when this change was made. Proceed.

A. When the oil fuel was substituted for gas, it was found that the greater flickering of the oil flame caused a vibration of the side walls of the precipitator units and that certain structural changes had to be made in order to make the precipitator perfectly safe to use. These structural

(Testimony of L. H. Duschak.)

changes, which consisted in attaching additional mechanical braces in the form of steel beams to the side walls, were made.

Mr. Moore: Q. Now, you have been in contact with the operation of this precipitator practically since it was installed, is that correct?

A. Yes, at intervals.

Q. Have you made certain tests or caused certain tests to be made as to the amount of dust that is collected by reason of this particular apparatus that you have described?

A. Yes. Just recently I conducted a series of tests, or directed a series of tests, at the Natividad plant for the purpose of determining the efficiency of the precipitator.

Q. You say you conducted. Will you describe to his Honor just what you did or how it was done—these particular tests.

A. I arranged to borrow from the Western Precipitation Corporation one of their test engineers, who had worked with me before and whom I knew to be particularly skilled in making these so-called stack tests. I met him at Salinas, at [228] Natividad, outlined to him the work to be done, and he started in. I visited the plant a few days later and spent part of a day with him supervising his work, and then received from him the test data which he obtained.

Q. In other words, he worked under your personal direction, did he? A. That is correct.

Q. You told him what you wanted done?

(Testimony of L. H. Duschak.)

A. I told him what I wanted done and how I wanted it done, what information I wanted him to obtain.

Q. Part of the time you were present and checked to see that he was carrying out your instructions, is that correct?

A. Yes, that is correct.

Q. Now, have you those tests? A. Yes.

The Court: Have you a copy?

Mr. Moore: I haven't a copy, no.

The Court: All right. It is near time to adjourn anyway. I have other matters to take up. You may turn that over to counsel for examination.

Mr. Naus: Can you turn it over to me for examination during the noon hour?

Mr. Moore: Yes.

(Thereupon a recess was taken until 2:00 p.m. this date.) [229]

Afternoon Session

September 14, 1944, 2:00 P. M.

L. H. DUSCHAK,

recalled:

Direction Examination (resumed)

Mr. Moore: Q. I believe, Doctor, before the recess I was inquiring from you as to certain tests and examinations that you made with regard to this dust catcher, and you had certain figures. Have you over the noon hour submitted those to Mr. Naus?

(Testimony of L. H. Duschak.)

A. Yes, I had just handed to Mr. Naus the reports that I made to Permanente Metals in November, 1942, and also a photostatic copy of this article by Mr. Anderson referring to some experiments as to the effect of duct on pollinization of certain——

Mr. Naus: If I may interrupt, that is what you just handed me?

The Witness: Yes, sir.

Mr. Naus: I ask that it be marked for identification.

The Witness: And in addition I handed you just before or at adjournment a copy of the test reports.

Mr. Naus: So as to clear the record, I ask that each be marked separately for identification. I want to make a statement about them.

(The documents were marked, respectively, Plaintiffs' Exhibits 7, 8, and 9, for Identification.)

Mr. Naus: No. 7 For Identification, if the Court please, [230] was handed me at the noon hour. I have had a full opportunity to examine it. If it should be offered by the defendant, I will make no objection.

Mr. Moore: We will offer it in evidence, your Honor.

The Court: Very well. Let it be admitted.

(Plaintiffs' Exhibit 7 For Identification was received in evidence, as Defendant's Exhibit K.)

(Testimony of L. H. Duschak.)

DEFENDANT'S EXHIBIT K STACK LOSS DETERMINATIONS TEST DATA

Permanente, Natividad, Sept. 8, 1944

Date	Kiln No.	Test No.	Gas Fuel		Kiln Feed		Pptr. Coll. lbs./24 hrs	Temperature F°			Test Duv'n Hrs.	Meter. Cond.			Thim. Catch gms.	3Pitot Ave. v.h.	Sample Nozzle dia. in.	B.P. in.	
			cu. ft. used	Time Hrs.	Time Raw Mat'l	Time Hrs.		Kiln	Pptr.	Stack		Pt-3	Ave. Vac.	Ave. T.F°					Cond. o.c.
9-1	2	1	406,524	8.0	127.88	8.0	72,900	920	580	405	5	295	0.42	81	165	11.972	.177	3/8	29.8
9-2	2	2	417,084	8.0	125.68	8.0	54,000	950	580	408	5	304	0.75	76	230	12.844	.176	3/8	29.7
9-3	2	3	.....	.....	.....	.....	.....	1040	620	401	2	219	1.30	70	165	7.254	.180	1/2	29.8
9-3	2	4	184,916	4.25	45.68	4.28	49,000	1030	610	415	4	413	2.00	62	345	17.331	.181	1/2	29.8
9-4	2	5	221,402	5.13	53.00	5.16	49,500	1010	610	405	5	306	0.43	59	265	8.022	.187	3/8	29.8
9-7	2	6	345,029	8.0	85.81	8.0	55,100	1020	615	418	5	302	0.39	81	130	10.894	.175	3/8	29.8

SUMMARY STACK LOSS DETERMINATIONS

Permanente, Natividad, Sept. 8, 1944

Kiln No.	Date	Test No.	Gas Fuel Ft3/hr.	Kiln Feed #/hr.	Temperature F deg.			Stack Gas		Pptr. Coll. #/24 hrs.	Total Solids #/24 hrs.	Coll. Eff. %	
					Kiln out.	Pptr. in.	Stack	Volume C.F.M.	Stack Loss #/24 hrs.				
2	9-1	1	50,700	31,900	920	580	405	51,200	4040	72,900	76,940	94.8	Day test, 5 hr. duration
2	9-2	2	52,100	31,400	950	580	408	51,000	4170	54,000	58,170	92.8	Day test, 5 hr. duration
2	9-3	3	.....	.....	1040	620	401	51,000	3310	.....	.....	.....	Day test, 2 hr. duration
2	9-3	4	43,500	21,600	1030	610	415	51,800	4230	49,000	53,230	92.2	Night test, 4 hr. duration
2	9-4	5	43,000	20,600	1010	610	405	52,700	2560	49,500	52,060	95.0	Night test, 5 hr. duration
2	9-7	6	43,100	21,500	1020	615	418	51,000	3600	55,100	58,700	94.0	Day test, 5 hr. duration

[Endorsed]: Filed 9-14-44.

(Testimony of L. H. Duschak.)

Mr. Naus: Plaintiffs' Exhibit 8 For Identification is a photostatic copy of a monograph entitled, "The effect of dust from cement mills on the setting of fruit." That was just handed to me, but I was previously familiar with it before coming to court, and I do not need to take time to read it now.

The final matter, No. 9 For Identification, you have just handed to me, Doctor, and we both know I have not even had a chance to start reading it.

The Witness: That is correct.

Mr. Naus: That is the situation, your Honor. I probably will want before I cross-examine the witness to read it.

The Court: That is all right.

Mr. Moore: Q. Doctor, directing your attention to Defendant's Exhibit K, which are some statistical data as to the amount of dust that is now being emitted from the stacks at Natividad, I will ask you whose handwriting that is in, if you know.

A. Mr. Brundage, the engineer who assisted me in these tests.

Q. In other words, he was the engineer who functioned under your [231] direction, is that correct? A. That is correct.

Q. Take those entries there, can you tell us what they mean? I mean if you will just kindly take that report and give the court the purport of it.

Mr. Naus: Do you mean take the abbreviated headings and amplify them so we will understand the abbreviations?

(Testimony of L. H. Duschak.)

Mr. Moore: That is what I mean, yes.

The Witness: The purpose of these tests was to determine——

Mr. Naus: No, I do not think that is what you asked him. I think you asked him to take the abbreviations of the headings and in words state what those headings mean.

Mr. Moore: I will restrict this question. I will go into the other matter later, a full exposition of what the test consists of and the results.

Q. So if you will, first, doctor, just take the headings there, state what those abbreviations mean.

Mr. Naus: They are all highly abbreviated.

Mr. Moore: Q. Take page 1, the first page of it, and start at the left-hand side; read them across—I mean the headings—and explain what they mean.

A. May I say first that many of these items are just detailed observations made in the course of the tests and are simply figures that are used in computing the results of the tests, and unless you feel it necessary to go into all this detail——

Mr. Naus: If the Court please, isn't it for counsel, rather [232] than the witness, to determine what he should answer when asked a question?

The Court: I think the suggestion is very helpful in analyzing it.

Mr. Naus: Your Honor has not even looked at it.

The Court: I am accepting his statement of what he says it is. I think if he gives a summing up

(Testimony of L. H. Duschak.)

of what was done there at that time and place and what he knows about it, himself, if this data means anything, he can point it out.

Mr. Moore: Q. Following his Honor's suggestion, will you tell us that?

A. The purpose of these tests was to determine the amount of dust which was being collected by the Cottrell precipitators and the amount of dust that was escaping into the atmosphere. One kiln was out of commission, so these tests, six in number, were made on what is known as the Kiln No. 1. I may add that Kiln 1 and Kiln 2 are substantially identical, and I have every reason to think that the results obtained on Kiln No. 2 were representative of what would have been obtained on Kiln 1 if we had been able to make those tests.

Q. Where were those tests made?

A. These tests were made on the stack of Kiln No. 2 at Natividad at an altitude of about 100 feet above the ground.

Q. In other words, about half way up?

A. About half way up the stack. These tests showed that the quantity of dust escaping from the stack in a twenty-four-hour period ranged from 2560 [233] pounds up to 4230 pounds; that the collecting efficiency ranged from 92.2 percent up to 95 percent.

Q. May I interrupt you just a minute there? You say from 92 point so and so to 95 percent; that means that they collected what percentage of dust?

A. That is the percentage of the dust which

(Testimony of L. H. Duschak.)

escaped from kiln into the flue system and precipitator.

Q. Do I understand that that is the amount of dust that resulted from the calcining of this material?

A. The total amount of dust resulting from the calcining is what we would call a hundred percent, and of this hundred percent the precipitator was collecting the percentages which I just mentioned.

Q. That is 92— A. 92.2 up to 95.

Q. In other words, to get the picture clear, if there was no dust catcher or precipitator, you used as your measuring basis or yardstick 100 per cent of dust, is that correct? A. Yes.

Q. This test that you made showed that of that 100 percent dust that was made—what are those figures?

A. 92.2 and 95 percent was being collected.

Q. Was being collected—that shows there was anywhere between 5 and about 7.8 percent of dust that still went into the atmosphere, is that correct?

A. Of the total dust produced, yes.

Q. Have you any way of measuring and determining what a hundred percent of dust is? I mean if there were none collected there, what would be 100 percent? Was there any way of measuring it, or have you made any studies or tests to determine that? [234]

A. Of course, in order to arrive at that percentage we also have to determine the amount which

(Testimony of L. H. Duschak.)

was being collected, and in a column headed "Precipitator collection, pounds per 24 hours," the values for the amounts of dust collected for the various test periods are given. These quantities range from 72,900 down to 49,000 pounds.

Mr. Naus: I do not think there is any column that quite reads what the witness stated. I would request that he state what column he is reading from now that is written on there.

The Witness: The column just referred to would be No. 11, numbering from the left-hand side of the sheet.

Mr. Moore: Q. That is the second sheet you are referring to, is it not?

A. Yes, the second sheet.

Q. Have you made any tests or studies at any time to determine the volume of dust that is put into the atmosphere as a result of this process?

A. You mean at the present time, or in recent times?

Q. At any time. Doctor, if you have made any tests at any time will you tell the Court about them?

A. These tests that I have just been reporting are the tests which were made to determine the quantity of dust which was escaping and the quantity of dust which was collected.

Q. Was there any way that you could measure the amount of dust that was escaping by pounds, square footage, or anything of that sort?

A. Yes. [235]

(Testimony of L. H. Duschak.)

Q. Did you make any tests along that line?

A. Yes, and I stated the results of those tests. Those are the first figures which I gave, which are on this page, 2, column 10, and in this column 10, which is headed "Stack loss," and the symbol for pounds every twenty-four hours is stated in pounds, the quantity of dust indicated by the test which would escape from the stack in a 24-hour period.

Q. Did you make any examination as to the chemical constituency of this dust as it escaped from the stack?

A. Yes, I have had a chemical analysis made of a sample of dust which we collected at this 100-foot point in the stack.

Mr. Naus: One moment. You have asked about one thing and he has answered about another.

Mr. Moore: I will reframe the question.

Q. You did make a test approximately halfway up the stack, is that correct? A. Yes.

Q. Can you tell us what that showed?

A. Yes, briefly it showed that the material was a mixture of calcium and magnesium carbonates with some calcium-magnesium oxide, and with small amounts of silica and the oxides of iron and aluminum.

Q. Have you the percentages? You have handed me a paper with some figures on it, Doctor. The lines are labeled A, B and C. Will you kindly explain that document that you handed me?

A. These designations A, B and C are sample designations. Samples A and B are samples of

(Testimony of L. H. Duschak.)

material collected by the Cottrell precipitator. [236] Sample C is of the dust collected in the stand at this 100-foot point.

Q. Taking those that were collected in the precipitator—those are samples A and B——

A. Yes.

Q. Will you state what their chemical constituency was?

A. It was substantially the same as that of the dust collected in the stack, that is, calcium carbonate, magnesium carbonate with some calcium oxide and some magnesium oxide.

Q. Can you give us the percentages?

A. The analysis as recorded here simply shows the quantity of calcium expressed as calcium oxide and the quantity of magnesium expressed as magnesium oxide. And I want to explain in advance that it does not mean that all the substances are present in that form in the analysis. For sample A, calcium oxide 38.2 percent; magnesium oxide 22.8 percent; R_2O_3 —and by that is meant aluminum oxide and ferric oxide 0.9 percent; insoluble—and by that we mean silica in this case—1.06 percent. The ignition loss 39.60 percent, and that reflects the amount of carbon dioxide expelled from this sample by heating it at high temperature.

Q. Taking the sample that you took—I believe Sample C—from the stack, what difference was there in its characteristics from those taken in the dust collector?

(Testimony of L. H. Duschak.)

A. I think that perhaps can best be answered by giving the actual analytical figures. Calcium oxide 35.45; magnesium oxide 21.2; R_2O_3 , 1.14; insoluble 2.22; ignition loss 39.19. [237]

Q. And those were taken in the stack at about half way up, is that correct? A. Yes.

Q. Have you made any other analysis of this material from that point forward? I mean, you have made no analysis at the top of the stack, have you?

A. I haven't attempted to collect any sample of the dust.

Q. You have made no collection of samples on any of these ranches, is that correct?

A. I haven't made any chemical analysis of any sample on any vegetation.

Q. Do you believe the report read here by Mr. Twining is unquestionably correct as to the constituency of the dust?

A. Yes, I have no reason to question his analytical results at all.

Q. What is Bordeaux mixture, Doctor?

A. Bordeaux mixture is an insecticide which is prepared by bringing together a slurry of calcium hydroxide and a solution of copper sulphate, sometimes known as bluestone or blue vitriol.

Q. What is that used for, if you know?

A. It is used for the control of certain fungus diseases. I am particularly familiar with its use as a preventive of brown rot in apricots.

(Testimony of L. H. Duschak.)

Q. In other words, the purpose of it is to kill this fungus growth, is that correct?

A. Kill the spores of the brown rot.

Q. Would you explain to the Court how this Bordeaux mixture functions in that regard?

A. No, sir, I am unable to do that, and I am not sure that anybody else can. What is known by [238] practical experience is that the Bordeaux mixture does destroy the spores of this brown rot and certain other diseases, and we can simply say by inference that it is the presence of caustic lime and of certain copper compounds, that when the lime and the copper sulphate are brought together, a number of copper compounds are formed.

Q. You refer to caustic lime. Can you tell us the chemical formula for caustic lime?

A. The so-called burnt lime or pick-lime, before it has been brought into contact with water, is calcium oxide. In the preparation of the Bordeaux mixture we have to slake this lime and add water to it, which converts the CaCO into calcium hydroxide, $\text{Ca}(\text{OH})_2$, shown on the second line on the blackboard there at the right hand. Some of that calcium hydroxide reacts with the copper in the preparation of the Bordeaux mixture, but there is a very considerable excess of that calcium hydroxide which remains in the mixture as such.

Q. This dust that escaped from the stacks, from your examination of it at the hundred-foot level, what similarity does it bear to the Bordeaux mix-

(Testimony of L. H. Duschak.)

ture? I mean from the standpoint of its chemical constituency.

A. The nearest approach would be to say that it contains a small amount of calcium oxide, which is one of the materials used in preparing the Bordeaux mixture.

Q. In other words, it is a form, using a lay term, of unslaked lime, is that correct?

A. That is correct. [239]

Q. That same material is used as the basis of Bordeaux mixture, is that correct?

A. Lime in a pure form, a reasonably pure form, is used as the basis for Bordeaux mixture, yes.

Q. The Bordeaux mixture, at the time it is used, it is combined with water, is that correct?

A. Yes.

Q. What happens when this dust comes out of these stacks and comes in contact with the water?

A. The lime, any lime in the dust particles is continuously absorbing carbon dioxide, which is present in the stack gas, and for some appreciable time after what we might call the gas stream leaves the stack, these particles will be in an atmosphere fairly rich in carbon dioxide and will continue to absorb carbon dioxide.

Q. How about moisture, water, H_2O ?

A. There is water vapor in the gas in the stack resulting from the actual water in the rock which is fed to the kiln, and also resulting from the combustion of the fuel.

(Testimony of L. H. Duschak.)

Q. Now, the absorption of the carbon dioxide from the air, the water, the hydrogen oxide or H_2O —the speed, if we may call it, of that combination with this dust that escapes from the stack, does that depend at all upon the character of the water?

A. Yes, in this way, that moisture, water vapor in the air, acts as a catalyzer. It speeds up the absorption of the carbon dioxide by any calcium oxide present, so in a region where humidity is high at times the rate of the carbonization would be greater than in an exceedingly arid region. [240]

Q. Is there any way it can be measured that you know of, that speed with which that absorption takes place?

A. It probably would be possible to devise experiments for measuring that.

Q. You have never done so?

A. I have never done that personally, no.

Q. But it is your opinion as an expert that the rapidity with which that chemical change takes place is dependent upon the character of the water, is that correct?

A. In so far as the character of the water relates to the amount of water vapor, the amount of moisture, the humidity of the atmosphere.

Q. Are you familiar with the climatic conditions generally in that area that lies to the west of the Coast Range here in California, and I am referring now particularly to Monterey County?

A. Reasonably, yes.

(Testimony of L. H. Duschak.)

Q. What is the character of the weather there, generally, throughout the year? Will you describe it?

A. One of the things that determines the character of the weather there is the break in the Coast Range formed by Monterey Bay, which permits a very considerable amount of fog to blow in from the coast, so that there is a region there where the humidity is rather high a good deal of the time. [241]

Q. You have been to the plant there at Natividad; you are familiar with it. What would be your view as to the humidity of the air in or about the plant there at Natividad and the Pista ranch?

A. I am hesitating, because one usually connected statements in regard to weather with different periods of the year.

Q. I was asking a general question first and then I want to break it down into the various seasons of the year.

A. Well, I would take this statement, for example, that on the average the humidity in the vicinity of Natividad and the Pista ranch is considerably higher than the humidity, say, 50 miles to the south or 25 miles to the south.

Q. You stated that you made your first examination in regard to the dust situation, I think, in November 1942? A. That is correct.

Q. From November 1942—and I am referring now particularly to the months of February, March

(Testimony of L. H. Duschak.)

and April of 1943—were you down in that vicinity at all? A. No.

Q. You were not down in Monterey County?

A. No.

Q. You have seen the weather reports as to the rainfall and wind in those months, have you not?

A. Yes, I have looked at those reports.

Q. But personally you were not present——

A. Personally I was not there.

Q. —and able to observe the weather. In general what did [242] those weather reports show with regard to the humidity and rainfall in and about——

Mr. Naus: Objected to as calling——

Mr. Moore: Just a minute, please.

Mr. Naus: I thought you had finished.

Mr. Moore: No.

Q. (continuing) —February, March, and April of 1943?

Mr. Naus: Objected to as calling for secondary evidence of a writing. The reports can tell what they show.

Mr. Moore: I can introduce them at this time.

Mr. Naus: You can offer them at this time, and I presume they will be received, but I certainly do not want this witness to tell me what the reports show when I can look at them myself.

Mr. Moore: I am going to pass the subject for a minute, because I do not happen to have a certified weather report with me, your Honor.

Mr. Naus: Weather reports do not need to be certified. They are distributed free. The Court

(Testimony of L. H. Duschak.)

can take judicial notice of them, I believe. But whenever it comes to a question of what is shown on a particular day, the uncertified report is the only evidence.

Mr. Moore: I am going to pass the subject because of Mr. Naus' objection, your Honor.

The Court: Very well.

Mr. Moore: And I am going to ask the privilege of [243] recalling the doctor on this particular subject when I have the weather report.

The Court: Maybe I can obviate the necessity of doing that. There can't be any question about the reports?

Mr. Naus: No, I will not dispute the reports. All I am getting at, if the Court please, if they are going to talk about what the weather reports show, let them bring them in and I will make no objection to them. I do not want witnesses to talk about what they think they remember the weather reports show.

Mr. Moore: We will have them tomorrow, Mr. Naus.

Mr. Naus: If the evidence otherwise concludes, I would be perfectly willing to bring the weather reports for any days or series of days, weeks, or years that could be found.

The Court: Does it give the rainfall during that period?

Mr. Moore: Yes, your Honor.

Mr. Naus: Temperature.

The Court: Does it report on the fog, too?

(Testimony of L. H. Duschak.)

Mr. Moore: I do not know that it does.

Mr. Naus: Total precipitation within two 12-hour periods.

Mr. Moore: Mr. Baggart is an expert on the matter, a horticulture expert. He says he believes they will show the foggy days, too, your Honor.

The Court: If that is in the report, isn't that as much as you want to show? [244]

Mr. Moore: No, I wanted to ask Dr. Duschak as an expert what effect that moisture in the atmosphere shown by these weather reports would have.

The Court: Assuming there was a foggy period——

Mr. Moore: What effect it would have on this dust.

Mr. Naus: I couldn't make any objection to that. All I am objecting to is this: If they are going to talk about reports, let us use the reports.

The Court: Proceed.

Mr. Moore: Q. Do you get my question?

A. Yes. As I understand it, you wish to know what effect the presence of moisture in the atmosphere would have on this absorption of carbon dioxide.

Q. That is right.

Mr. Naus: I think he has testified to that a number of times, but I won't complain about it being done again.

The Witness: I testified it would accelerate the absorption of the carbon dioxide.

(Testimony of L. H. Duschak.)

Mr. Moore: Q. In other words, if I understand you correctly, a condition of the atmosphere where there was moisture in the air would accelerate the changing of the calcium oxide into calcium carbonate?

Mr. Naus: If the Court please, objected to as asked and answered several times. The witness has repeatedly testified that the weather will act as a catalyzer. [245]

The Court: He may answer.

A. Yes.

The Court: All right.

Mr. Moore: Q. In your opinion, Doctor, does calcium carbonate or magnesium carbonate have any effect on the pollinization of fruit?

Mr. Naus: I object to that as asked and answered three or four times.

The Court: He may conclude.

A. No.

Mr. Moore: Q. In your opinion, from the chemical analysis that has been shown here by Mr. Twining, there is nothing in that chemical analysis that could in any way affect the pollinization, is that correct?

A. There is no substance shown by his analysis as present in the dust that could interfere with the pollinization of the apricots.

Q. Maybe I asked this: In these tests that you make, Doctor, can you tell us what portion was carbonated in the stack, I mean at that 100-foot stage?

(Testimony of L. H. Duschak.)

A. I can state what proportion of the sample collected at that point was carbonated and what proportion was oxide.

Q. Would you do that?

A. It was approximately 77 per cent carbon; that would mean 23 per cent would be oxides.

Q. As that passed up the stack and into the air would that change from oxide into carbonate continue?

A. Yes, and if I [246] might explain just a bit there—and I think it has a bearing on this situation—, this process of absorption of the carbon dioxide necessarily begins on the surface of the grain and proceeds from the surface inward, so that if we think of a grain which has been completely calcined, that is, consisted entirely of calcium and magnesium oxide as it left the kiln, the moment it came into the region of lower temperature, in contact with the carbon dioxide, the absorption of this gas would begin and it would reflect first on the outer surface of the grain, so that after partial carbonization had occurred we would have an outer shell of calcium and lime carbonates and an inner core of oxides. Then this inner core of oxides gradually diminishes in quantity as the exposure of the particle to an atmosphere containing carbon dioxide and moisture continues.

Mr. Moore: No further questions.

Mr. Naus: If the Court please, could we take the recess earlier so I may have an opportunity to read the subject data?

(Testimony of L. H. Duschak.)

The Court: Very well. The court will recess.

(Recess.)

Mr. Naus: Shall I proceed, your Honor?

The Court: Proceed.

Cross-Examination

Mr. Naus: Q. I understand in your direct testimony you were first employed or retained by the defendant The Permanente [247] Company as of November 10, 1942; correct?

A. No, that is not correct.

Q. When was it, then?

A. In the summer of 1939.

Q. Between that date and the 14th of November 1942 you investigated the matter of this dust escaping from the stack into the surrounding country, didn't you, to some extent?

A. The dust escaping from the Natividad plant?

Q. Yes. A. Yes, sir.

Q. And as a result of that investigation you made a report—— A. Yes.

Q. —to The Permanente Metals Corporation, your employer? A. Yes.

Q. And this is the report that you made as of that date? A. Yes, that is a copy.

Q. Well, that is a carbon duplicate of the original, isn't it? A. That is correct.

Q. It is in all respects like the original?

A. Yes.

Mr. Naus: I offer it.

The Court: It may be admitted and marked.

(Testimony of L. H. Duschak.)

(The report was marked Plaintiffs' Exhibit 9 in evidence.)

Mr. Naus: With no desire to take up time, I would like to read this report at this time, if your Honor please.

The Court: Proceed.

Mr. Naus (reading): "November 14, 1944"—

Q. By the way, Doctor, I presume that was on your letterhead, [248] was it?

A. The original was on my letterhead, yes.

Q. How does that letterhead read?

A. "L. H. Duschak, Consulting Engineer, San Francisco, California."

Mr. Naus: It is addressed to the Permanente Metals, P. O. Box 29, San Jose, California, Attention Mr. D. A. Rhoades. Subject, Natividad Plant—Dust.

Mr. Moore: I do not want to interrupt you, Mr. Naus, but you might tell his Honor who Mr. Rhoades is.

Mr. Naus: I was about to do that when you did interrupt.

Q. This says, "Attention: Mr. D. A. Rhoades." Who is he?

A. Mr. Rhoades is the general manager. I believe his title is Project Manager for the Permanente Metals, headquarters at Permanente.

Q. He is the man the defendant designated that you should report to, was he?

A. He was the man who requested me to make the examination.

(Testimony of L. H. Duschak.)

Mr. Naus (reading): "Gentlemen:

Pursuant to Mr. Rhoades' letter of October 26th, I called at your Natividad plant on Wednesday, November 11th"——

Q. I pause there for a moment. Have you a letter of October 26 from Mr. Rhoades?

A. I did have.

Q. Have you one now? A. I couldn't say.

Q. Will you look for it over night, and if you have one produce it tomorrow morning?

A. I will look for it, yes. [249]

Mr. Naus: Gentlemen, have you a carbon of Mr. Rhoades' letter referred to?

Mr. Moore: I have not. We can probably find it.

Mr. Naus: If you can, will you try to find it and produce it tomorrow morning?

Mr. McCarthy: I doubt if we can produce it by then. It probably would be down at Permanente. I will try to.

Mr. Naus: Thank you. (Reading):

"Pursuant to Mr. Rhoades' letter of October 26th"——

Q. That would be 1942, I take it, Doctor?

A. Yes.

Mr. Naus (continuing reading):

"—I called at your Natividad plant on Wednesday, November 11th,"——

Q. That is 1942, Doctor? A. Correct.

Mr. Naus (continuing reading):

"—and in company with Mr. John Garoutte"——

(Testimony of L. H. Duschak.)

Q. Who is he?

A. He is the superintendent of the Moss Landing and Natividad operations.

Q. So that wherever you accompanied him in this investigation, he joined you in making an investigation for the Permanente Metals Corporation; correct?

A. He acted as my guide.

Mr. Naus (continuing reading):

“—an inspection was made of the plant and surrounding territory.

It is my conclusion that the dust condition about [250] the Natividad plant is serious, and one which might become exceedingly troublesome if not given early attention. The dust which has fallen on adjoining ranch property is sufficient to form the basis for nuisance complaints and claims for damages. Recent California court decisions in generally similar cases have resulted in the issuance of injunctions and in the awarding of damages, where damage suits were filed. Under normal conditions there would be a strong probability that court action on the Natividad case would lead to injunction and award of damages. Under existing conditions the court might hesitate to interrupt plant operation, but would probably award damages.

The field situation is briefly as follows: a noticeable deposit of dust was observed on foliage along the Gabilan Creek road”——

Q. I would like to pause here a moment and call your attention, Doctor, to Plaintiffs' Exhibit 1, which is a scale diagram of the locality showing

(Testimony of L. H. Duschak.)

the plant site, the stockpile, the old Los Angeles Stage Road, Gabilan Creek, and then a meandering road roughly paralleling Gabilan Creek. Is that meanderin groad roughly paralleling Gabilan Creek the one you were journeying over?

A. Yes, that was one of the roads.

Q. Referred to in the letter? A. Yes.

Mr. Naus: (continuing reading): [251]

“—a noticeable deposit of dust was observed on foliage along the Gabilan Creek road, approximately 3 miles north of the plant. At points nearer the plant along this road heavier dust deposits were observed. Inspection of the territory to the west and south indicates the following boundaries for the area within which the deposit of dust has occurred in sufficient quantities to constitute a probable nuisance, namely 3 miles north, 2 miles south and 1 to 1.5 miles west.”

Q. I pause for a moment. The Pista orchard is about a half mile west of the plant, isn't it, Doctor?

A. Approximately that. I thought it was nearly a mile, but I haven't measured the distance.

Q. From a half mile to a mile; the nearest boundary would be about a half mile, and the farthest exterior boundary about a mile, is that correct?

A. To the best of my knowledge, that is approximate, yes.

Mr. Naus: (continuing reading):

“—and 1 to 1.5 miles west. The deposits ob-

(Testimony of L. H. Duschak.)

served are the result of some three months' operation of the plant, and may be taken as representing roughly one-half of the total deposition which would take place during the whole dry season. Eastward of the north-south line through the plant, there is only rough country from which complaint is unlikely. [252]

In the late afternoon of Tuesday, November 10th, it was noted that the atmosphere in the vicinity of the plant was almost stagnant, and that a considerable cloud of dust accumulated at a level roughly estimated at 1000 feet above the ground. This cloud spread out toward the hills, extending more to the north than to the south. I was informed that a generally similar condition had been observed a number of times. This is probably the result of the so-called 'reversal' of atmosphere which frequently occurs in the late afternoon or early evening. Presumably the heavier deposits of dust in the vicinity of the plant and to the north are due to this condition.

Within the area indicated above, the following market crops, apricots, tomatoes, and strawberries are grown, and possibly there are others. It is doubtful whether the plant dust would cause any diminution in crop, but it would unquestionably reduce the market value of the crops just mentioned. The drying of apricots within the dust zone would be out of the question. In addition there are home gardens in which vegetables and small fruits such as blackberries are grown. At

(Testimony of L. H. Duschak.)

two ranches we were informed that no attempt had been made to use the blackberry crop because of the dust on the fruit. I do not regard this as a prejudiced decision.

The actual loss to ranchers this fall has not been [253] serious, since the principal crops had been marketed, but the situation would be different next year."

Q. When you speak of "next year," you meant the crop season of 1943, didn't you, Doctor?

A. Yes.

Mr. Naus (continuing reading):

"The effect of dust on these crops next year would undoubtedly provide evidence with which successful damage suits and nuisance claims could be prosecuted.

Mr. Garoutte informed me that an analysis of a sample of dust showed that it consisted of a mixture of calcined and uncalcined material. This was confirmed by my examination of a sample of dust which I collected near the base of the stacks. A screen analysis of this dust showed that approximately 52% was finer than 325 mesh"—

Q. What is the abbreviation there? Is that for "millimeters"?

A. Yes, 0.046 mm., millimeters.

Q. The parenthesis refers to 46/1000 of a millimeter, doesn't it? A. Correct.

Mr. Naus (continuing reading):

"... and a microscopic examination of the minus 325 mesh fraction showed the presence of many

(Testimony of L. H. Duschak.)

particles ranging from 5 to 10 microns in diameter. One characteristic of this dust which permits its ready identification on foliage is the crystalline character of even the very minute particles of uncalcined material. The crystal faces of [254] these minute particles show a sparkle in the sunlight even when the dust particles are too minute to be observed with the naked eye.

The one certain way to avoid litigation and other trouble would be to install an adequate dust collecting system. Three methods are thinkable, wet scrubbing, centrifugal collection, (Multiclone or similar device), or electrostatic precipitation. In view of the high temperature of the dust-laden gas, 900° to 1150° F."—

Q. "Fahrenheit"—that is what the "F." means, doesn't it? A. Yes.

Mr. Naus (continuing reading):

"—both the installation cost and operating cost of a wet scrubber would be high. It is my opinion that electrostatic precipitation by the Cottrell process offers the best solution of the problem, although the possible use of Multiclones might be considered. In any case, fans will have to be installed, as the stacks now provide no excess draft. While the first cost of a Cottrell Precipitator will be high, its operating cost will be much less than for the Multiclones, because of the lower fan power required and negligible maintenance. However, the principal reason for favoring electrostatic precipitation is

(Testimony of L. H. Duschak.)

because of the higher collecting efficiency which can be obtained. I have knowledge of cases where Multiclone installations were made on the basis of small scale [255] tests which indicated satisfactory clearance, only to find later on that a dust nuisance still existed. It is recommended that the necessary data be obtained with respect to the cost of dust collecting equipment.

There is a further point to be considered in this connection. The writer was informed that it had been found impracticable to raise the production beyond 165 tons per kiln per day,"——

Q. That would be 330 tons for the twin kilns, wouldn't it, Doctor?

A. It would be two times.

Mr. Naus: Yes.

"—and that the limiting factor appeared to be lack of adequate stack draft. This conclusion is undoubtedly correct, as a study which I made in April of the specifications for the Natividad stacks led to the conclusion that there was a theoretical margin of not more than 0.03 inches water gauge on the basis of capacity and fuel figures supplied by the F. L. Smidth Company. This finding was reported to you at that time. Actually the fuel consumption per ton of finished product is slightly higher than that estimated by Smidth. Thus if kiln production is to be increased, additional draft must be provided. Presumably the only practicable way is by the installation of fans. The provision of this necessary fan capacity could be easily taken

(Testimony of L. H. Duschak.)

care of in connection [256] with the installation of dust collecting equipment.

If kiln capacity is increased in this way, the probable increase in dust pick-up should be given careful attention. An increase in capacity from the present 165 tons of finished product per day to say 200 or 210 tons might double the amount of dust picked up by the gas streams. This should be considered in connection with the design of dust collecting equipment, and also in any study of the dust disposal problem. A further point requiring consideration is the cooling of the gas streams. For ordinary sheet steel construction an entrance temperature of about 800° F. is considered to be the safe maximum. This can be raised by using heat resisting construction at considerable additional expense. For concrete the limit is lower. Further, an increase in kiln capacity would probably raise the temperature of the outgoing gas. The gas cooling problem should be examined with this circumstance in mind.

Cooling can be effected by cooling pipes, by admission of outside air, or by the use of water sprays. The first two are the preferable methods, and engineering studies are indicated to determine which will be the more economical. Cooling by admission of cold air increases the gas volume to be handled, and consequently the cost of the dust collecting equipment, of the fans and of the power [257] for operation. Cooling with water sprays

(Testimony of L. H. Duschak.)

also increases the gas volume, but not to the same extent.

The conditions at Natividad seem particularly favorable for the use of atmospheric cooling pipes. The dust is neither abrasive, corrosive nor sticky, and should cause no difficulty in a properly designed pipe cooler. Cooling in this way will permit the use of smaller dust collectors and fans than with the other cooling methods suggested. Thus the cost of the pipe coolers may be balanced against the saving on collectors and fans.

A few words concerning the general strategy of the situation: the attitude of two residents within the dust zone with whom I talked was friendly but insistent as to the gravity of the nuisance. I cannot stress too strongly the wisdom of dealing with this situation before real antagonism and bitterness has developed. The present situation holds this potential danger. If an 'ambulance chasing' type of attorney became interested, he might easily convince a considerable number of residents in the vicinity that they were experiencing damage and thus build up a formidable list of plaintiffs. This has happened in other cases, and could happen about Natividad if the dust situation is not promptly dealt with. The cost of defending suits filed by a number of plaintiffs would be considerable. Extensive field work would be necessary to delineate the dust zone, and thus exclude many claimants who contrary to fact might have been induced to believe that they were suffering dust

(Testimony of L. H. Duschak.)

damage. It is probable that the cost of meeting this imagined situation would be considerably greater than the cost of installing adequate dust collecting equipment.

It is the writer's judgment that it would not be advisable at the moment to make a quantitative field study of the dust fall in what appears to be the dust zone. This will only attract further attention to the situation, and serve very little useful purpose at the moment. Later on a survey of this sort might become necessary.

There are cases, notably in connection with smelter smoke damage, where 'smoke rights' or 'dust rights' have been purchased, or where property has been purchased outright. This policy of 'appeasement' usually turns out to be extremely expensive, and does not always solve the problem. It has the obvious disadvantages that it involves admission on the part of the operator of responsibility for nuisance and damage. Moreover the administration of such a plan involves considerable expense, as many claims will be made by people who are entirely unaffected by dust. Each case has to be investigated and adjusted. This may involve litigation, or a compromise payment which is in reality nothing more than blackmail. [259]

In conclusion, I recommend that the Natividad dust problem be given immediate attention. The desirability of finding a solution before a group

(Testimony of L. H. Duschak.)

of 'chronic dust farmers' has been organized cannot be overemphasized.

Respectfully submitted,
/s/ L. M. DUSCHAK."

The Witness: L. H. Duschak.

Mr. Naus: Pardon me. Yes. The carbon is a little blurred. My glasses aren't always the best. "L. H. Duschak." [259a]

Q. Now, as nearly as November, 1942, Doctor, were you undertaking to *to* act for Permanente in being the strategy arranger in handling those damage and injunction claims arising from dust around Natividad?

A. I was endeavoring to perform the full duty of a consulting engineer who is asked to advise a company what it should do in certain circumstances.

Q. I only know the duty of a lawyer, I don't know that of an engineer, so will you tell me whether, as early as November, 1942, you were undertaking to act as the strategy arranger for Permanente Metals Corporation in meeting these damage and injunction claims arising from dust around Natividad?

A. Among other things I was undertaking to inform the Permanente Company of the large amount of annoyance that certain kinds of lawyers can cause a corporation.

Q. Ambulance-chasing lawyers, blackmailing lawyers—is that the kind that you had in mind you

(Testimony of L. H. Duschak.)

were warning them against as a consulting engineer?

A. I think I used that designation in my report, yes.

Q. Doctor, I will ask you whether, in your opinion as an expert you consider the Pista claim founded on blackmail?

A. Well, I consider it—I wouldn't say it was blackmail; I consider it a claim which tries to hold the Permanente Company responsible for many, many things with which it has no connection whatsoever.

Q. I see. Now, turning for a moment to Defendant's Exhibit K, [260] here; that represents the statistical features of the study of the dust still escaping from the stack, doesn't it?

A. Yes, it gives the actual quantitative result of various observations that were made in determining the dust loss from the stacks and the efficiency of the precipitator.

Q. Now, that precipitator was installed and put into function as a dust collector when?

A. In the summer of 1942.

Q. Could you tell me what month or months you may have in mind in speaking of the summer?

A. The best evidence I have is in that report of mine which you just read, in which I said that the precipitator had been in operation, I believe it was, for about three months prior to the date of my visit.

Q. Doctor, you state in there about the plant having been in operation three months and you

(Testimony of L. H. Duschak.)

were recommending that the precipitator be installed.

A. Oh, I beg your pardon; I was confused as to your question.

Q. When was the precipitator installed and functioning, the one that you recommended in that letter?

A. I can't tell you of my own knowledge.

Q. Was it before or after or during apricot blossom time around Natividad in the year 1943?

A. My impression is that it was not put in operation until after the blossoming time.

Q. I think you are quite correct about that. Now, the fact is, is it not, to the best of your recollection and observation and knowledge, that this Cottrell precipitator was not functioning [261] at that plant in apricot blossom time in 1943 but was functioning at that plant in apricot blossom time in 1944; am I correct?

A. Yes, but in 1944 functioning with some difficulty during blossoming time.

Q. I know, but without pursuing the minute detail——

Mr. Moore: Just a minute. Please let the witness answer the question.

Mr. Naus: Please let me finish a question, because I was in the middle of the question. I think he had finished his answer.

Mr. Moore: He did not. I will ask that the question and answer be read and the witness be permitted to finish the answer.

(Testimony of L. H. Duschak.)

The Court: You may read the question and answer.

(The reporter read the previous question and answer.)

Mr. Naus: Q. Is that answer complete, Doctor?

A. Yes.

Q. I thought so. Well, you say functioning with some difficulty in apricot blossoming time in 1944. Translating that into tons of dust escaping into the atmosphere from the top of the stacks, how many tons of dust were escaping, having in mind that difficulty?

A. I can't answer that because I didn't make any measurements, but I would say it would be, on occasions, many times the amount shown in that report which you are holding in your hand.

Q. How many times, on occasions, and for how long occasions?

A. I made no tests. I wasn't there, so anything that I said [262] would be simply an opinion based on what I was told by others. I saw some reports which showed efficiencies down to 70 percent.

Q. Was it ever lower?

A. 70 percent would mean that there was escaping 30 percent of dust as against an average of, let us say, about 6 percent; in other words, five times the amount of dust shown by that report.

Q. All right. Now, having in mind that you are suggesting that there was that poor functioning during apricot blossom time in 1944, I will ask you

(Testimony of L. H. Duschak.)

what was apricot blossom time in 1944 in that region?

A. It was in—I don't know the exact date, but in general from about the 1st of March onward.

Q. In the year 1944 from what date to what date was the Pista apricot orchard in bloom or in blossom?

A. I didn't observe it; I would only answer that on the basis of the record I heard made here.

Q. Isn't it the fact that you don't know?

A. Except if I believe your witnesses.

Q. I am speaking of your personal knowledge; I am not asking you to pass judgment on the witnesses, Doctor; I will leave that to his Honor.

A. Obviously, I said I wasn't at Natividad all that spring, so I can't know by my own direct knowledge.

Q. Well, of your own knowledge do you or not know whether that Cottrell precipitator was functioning well or poorly during apricot blossom time in the Pista orchard in 1944?

A. I know that it was functioning poorly. If I may explain, I happen to [263] have some apricot trees in my yard, so I know about the blossoming time of apricots in California.

Q. Where is your yard where you have these apricot trees? A. Over in Berkeley.

Q. Well, then, I will ask you then, as you seem to know something about apricots, or suggest that you do, do apricot trees blossom in Berkeley at the

(Testimony of L. H. Duschak.)

same time of the year that apricot trees blossom in the Natividad region? A. I believe not.

Q. I think you are right about that. Do they blossom in Natividad at the same time they do in the Santa Clara Valley?

A. No, I think they are somewhat later there at Natividad.

Q. Do they blossom at the same time they do out around Hayward, San Leandro and the like?

A. I couldn't say; I haven't observed that.

Q. Now, under this Defendant's Exhibit K, those were tests that were made on each of six days from September 1 to September 7, both inclusive, is that correct, of this year?

A. Yes, these tests show—this record shows that the tests were made September 1st, 2nd, two on September 3rd, one on the 4th, and one on the 7th.

Q. Right on the very eve of this trial, is that correct? A. That is correct.

Q. They are the latest information you have on this subject as to the performance of those stacks, aren't they? A. That is correct. [264]

Q. Now, at the present time, and at the time of these tests, what was the average daily total tonnage of raw dolomite out of the quarry handled through that plant?

A. That report shows.

Q. Would you tell me, please?

A. I am looking at column 6 numbered from the left hand on the same page of this report which is headed "Kiln feed, tons, raw material," and these

(Testimony of L. H. Duschak.)

are tons for an eight-hour period. Do you wish me to read the various values that I see here?

Q. No; look at anything you please that will answer the question. I am speaking not of an eight-hour period, but of days; I am speaking of the average tonnage of raw dolomite taken out of the quarry and put through the plant at Natividad.

A. Well, I didn't make any observation of the amount of material taken out of the quarry. All that I have here is a record of the amount fed to the kiln during the different periods when these tests were being made, and that amount, reckoned on an eight-hour basis, ranges from 127.88 tons down to 45.68.

Q. That is for eight hours, or one-third of a calendar day, is it?

A. Yes. May I correct this: The highest figure for an eight-hour period is 127.88 tons.

Q. That is raw dolomite, is it?

A. That is raw dolomite.

Q. Now, I know nothing as to the length of time that plant operates. How many hours a day does it operate?

A. The kilns ordinarily operate right through the 24 hours, on the average about 23 out of the 24 hours, unless a shutdown is necessary for [265] repairs, so that we might say at full operation for a 24-hour day, the quantity of raw dolomite fed might be of the order of 400 tons per kiln.

Q. Would you do that on a basis of multiplying the figures you have there by 3?

(Testimony of L. H. Duschak.)

A. For the eight-hour periods. These other quantities are for shorter periods.

Q. I am assuming that any place you find an eight-hour period there you multiply by 3, roughly, to get the day? A. That is right.

Q. That would be 400 tons per day ?

A. Approximately that, yes.

Q. That would be only one kiln, wouldn't it?

A. Yes.

Q. Wouldn't you have to multiply that result by two to get the whole plant?

A. If both kilns are running full blast, yes.

Q. Don't both kilns generally run?

A. Sometimes one is shut down; sometimes one is being used for other work.

Q. In any event, those tests there show only one kiln, and to show the operation of two kilns you would roughly consider them twins, wouldn't you, and multiply by 2? A. That is correct.

Q. Now, look in there and tell me the maximum amount of dust escaping from the top of the stack into the atmosphere in any eight-hour period during the time of the test.

A. I will have to do a little arithmetic here, because these results are stated for a 20-hour period, so that is—you ask for the largest amount escaping——

The Court: What is the objection to getting it in the [266] 24-hour period?

Mr. Naus: I beg your pardon?

(Testimony of L. H. Duschak.)

The Court: What is the objection to getting it in the 24-hour period?

Mr. Naus: None at all. I didn't realize it was in that form at the moment when I put the question. I will reframe the question.

Q. Tell me the highest amount of dust escaping into the atmosphere from the top of the stack of Kiln No. 2 during the period of this test in a period of 24 hours?

A. These figures I am about to state are from column 10 counting from the left on sheet 2 of this exhibit. The largest quantity shown there is 4230 pounds, which is the amount of dust escaping during a 24-hour period from the stack of No. 2 kiln.

Q. Yes. And with both kilns or both stacks——

The Court: That is 44?

Mr. Naus: Yes.

A. This was.

Mr. Naus: Q. Let me pursue that question. You are speaking now of a test made within roughly one week before this trial began in the month of September.

A. The first week in September, 1944.

Q. All right. And so far as you know it represents the condition existing at this very moment down at the plant? There has been no change that you know of, has there?

A. No, none that I know of. [267]

Q. That states it correctly, doesn't it?

A. Yes.

(Testimony of L. H. Duschak.)

Q. All right. So with 4200 pounds of dust escaping into the atmosphere from the stack of Kiln No. 1, then with both kilns and both stacks in operation we must assume, must we not, 8400 pounds of dust escaping into the atmosphere from the two stacks in one twenty-four-hour period?

A. As a maximum figure, yes.

Q. As a maximum figure and as an actual figure for a particular period of test, isn't that correct?

A. For one test period.

Q. All right. Doctor, assuming the same operation of running ore through the plant but before that Cottrell precipitator was installed and functioning, on the basis of these tests, what would be the total tonnage of dust escaping into the atmosphere from the top of the stacks in a 24-hour period?

The Court: Do you have in mind now 43?

Mr. Naus: Yes, your Honor. That is, that part of 43 before the precipitators were functioning.

A. If we assume that the kilns were operating at the same rate of feed as during the period of these tests, then the total quantity of dust escaping would be probably something like 80 or 90 percent of the total quantity of solids per 24 hours shown in column 12 on the second sheet of this report; that is, I would say it would be 80 or 90 per cent of values ranging from 52,000 to 72,940 pounds per twenty-four hours.

Q. For one stack? A. For one stack, yes.

Q. All right. Then from one stack before this

(Testimony of L. H. Duschak.)

precipitator [268] was functioning you would assume anywhere from 28 to 38 tons per day from one stack, is that correct?

A. If the kilns are operating at the same rate.

Q. I will come to that in a moment. But I have matters correct so far, haven't I?

A. Yes, correct.

Q. And for both stacks, both kilns, you would have to assume from 56 to 76 tons per day of dust escaping from the top of the stacks into the atmosphere, is that correct?

A. Yes.

Q. And to follow that out, theoretically, at least, if you want to know the total escape of dust over any given number of days, you simply multiply those figures by the number of days, don't you?

A. If you make the assumption that the plant was running continuously at this high capacity.

Q. We will make that for the moment. Now, has that been a plant of continuous operation?

A. I am unable to answer that, because I haven't been receiving operating reports.

Q. So far as you know, and from any investigation or studies you have ever made, do you know or can you tell?

A. It is my impression that it is operated continuously.

Q. Continuously every calendar day, Sundays and holidays?

A. Oh, no, there have been shut-downs for repairs, shut-downs when the Cottrells were installed; there have been many occasions when no kiln or only

(Testimony of L. H. Duschak.)

one kiln was operating, and sometimes at reduced capacity.

Q. Out of 365 calendar days of the year, would it be fair [269] to assume that the both kilns operated 300 full days a year?

A. I am not prepared to answer that, because I haven't the information.

Q. You are not prepared to give any information about that, are you?

A. Not beyond what I have just given you.

Q. Doctor, when you went around with Mr. Garoutte, or, rather, under his guidance, in November, 1942, to find out what dust was around on vegetation, did you or not find both calcined and uncalcined dolomite?

A. I observed particles of uncalcined dolomite which could be very definitely identified by their crystalline character. I observed other particles which were of dull color, which I assumed were particles which had been calcined and then recarbonated by contact with stack gas and the atmosphere.

Q. And you observed those on vegetation, didn't you? A. Yes.

Q. Well, to the extent that in your examination—your field examination—let us say in November, 1924, showed these sparkling crystals or sparkling particles that had the crystalline character, did they come out of the top of the stack, or did they come from the quarry operation?

A. To the best of my knowledge and belief, they came from the top of the stack, because there was

(Testimony of L. H. Duschak.)

nothing in the quarry operation that would cause the dissemination of that very fine dust.

Q. Do you remember turning around on that witness stand yesterday and facing his Honor, Judge Roche, and telling him that after [270] it had gone through the stack it went back to its original chemical analysis, but changed physical form in that it was no longer crystalline?

A. I made that description of the particles which had been calcined.

Q. Yes.

A. That is, the particles of calcined material which had passed through the kilns and through the stack and into the atmosphere.

Q. Do you mean to say that raw dolomite goes through those kilns and through the stacks—any particle—and comes out uncalcined?

A. I mean to say that if a gas leaving the Natividad kilns, there are considerable quantities of raw, totally unaltered dolomite.

Q. Doctor, in that letter here you mentioned in one place the size of these particles. I presume you are speaking in scientific terms of the diameter of particles, the measurement? A. Yes.

Q. I will ask you this question: You may take a paper and pencil, if you wish, because I would like you to if you need to—how many of those particles of the size you speak of in the letter would be contained in one pound of that dust?

A. Well, that would involve quite a calculation. I will be glad to make it for you and report it later.

(Testimony of L. H. Duschak.)

Q. I would like to have it done, if you please, Doctor. I see it is 3:30. May I have the doctor give us that information tomorrow morning at 10:00 o'clock, so I can pass on to something [271] else? Would you have it by ten o'clock? A. Yes.

Q. Now, there is——

Mr. Moore: Pardon me, just a minute, Mr. Naus. Do you understand exactly what calculation Mr. Naus wants, Doctor?

A. If I may state my understanding of your request.

Mr. Naus: Yes.

A. It is for the number of particles of minus 325 mesh size of uncalcined dolomite.

Q. Let us clear it all up. I am trying to find the number of those fine particles as they come out of the top of the stack that are necessary to make one ponnd of dust. I am merely assuming, upon reading the letter, that you have measured the particles at some time and could have that as a starting point.

A. All that I stated in my letter was that a certain percentage was finer than 325 mesh, and went on to explain that many were as small as 10 microns. You will have to tell me what size you are interested in before I can tell you the number of particles per pound.

Q. Will you tell the number of particles per pound for each of the sizes mentioned in that letter? That will be two or three different results, apparently: or at least give us a range number.

(Testimony of L. H. Duschak.)

Mr. Moore: Let us get the sizes so that there is no misunderstanding.

A. I speak of 325 mesh particles, which is 0.046 millimeters in diameter; and I speak of many particles ranging from 5 to [272] 10 microns in diameter. That is 5 to 10 thousandths of a millimeter.

Mr. Naus: Yes. For each of those sizes, give me the number per pound separately, please. So far as you know at the moment, that is the size of dust that comes out of the top of the stacks now, isn't it?

A. No; this sample you referred to here was not comparable with the dust that is coming out of the stack now.

Q. What is the size of the particles of dust that come out of the stack now?

A. I haven't determined that.

Q. Have you any idea?

A. Yes, I think that on the average it is finer than the material referred to here.

Q. And when you say finer, you would express that in numerals how?

A. Probably in—I would describe the diameter of the particles in microns.

Q. Yes; and how many?

A. I couldn't answer that without an examination of the dust.

Q. I see.

A. But in a qualitative way, it would be my opinion that there would be a greater proportion of the minus 325 mesh in the present stack output.

Q. All I am asking you to do is to find the

(Testimony of L. H. Duschak.)

number of particles in a pound of dust. We have one approach that I have suggested. If you think of any other over night that is better use that as well.

The Court: Do you understand what he wants?

A. Yes, I think I understand what he wants.

The Court: All right. [273]

Mr. Naus: Q. In Plaintiff's Exhibit 2 we have an airplane view that I borrowed from Mr. Moore at the beginning of the trial to help his Honor understand the locality. Now, in looking at that we find one place that is called "Plant area." You recognize that as the area where the kilns and stacks are that we have been talking about?

A. Yes.

Q. Up hill from it there are two different places, one called "Bethlehem quarry" and the other called "Quarry area." From which of those two places thus legended is and has been the dolomite actually quarried?

A. From what is marked "Quarry area."

Q. Has any quarrying occurred at what is called there "Bethlehem Quarry"?

A. Yes, I think so. I was up at that vicinity on, I think, two occasions, and saw some evidence of quarry operations there, but I have no knowledge of them.

Q. Now, those quarries are up the hill from the kilns, aren't they?

A. Yes, they are at a higher elevation than the kilns.

(Testimony of L. H. Duschak.)

Q. About what is the elevation of the floor of those quarries above or below the top of the stacks?

A. Well, I have never measured that.

Q. Your estimate?

A. As regards the Permanente quarry area, it is my impresison that that quarry floor is roughly on a level with the top of the stacks.

Q. So any dust escaping into the atmosphere from those quarries would escape into that atmosphere at approximately the same elevation above the Pista ranch that dust escapes from the top [274] of the stack, is that correct?

A. That is correct, but that is only part of the story.

Q. Well, you have got a very able attorney here.

The Court: You may explain, if you wish.

A. The distinction which I wish to make is that the dust escaping from the stacks is carried by a stream of hot gas which tends to rise high in the atmosphere and to spread over a large area, whereas any dust formed in the quarry by some abrasive action or blasting is associated with air at ordinary atmospheric temperature and in general rises only a short distance above the point of origin.

Mr. Naus: Q. Has it traveled through the air sufficient distance to alight in the Pista orchard?

A. That would depend entirely on wind velocity and direction. It is conceivable dust from the quarry could blow onto the Pista ranch.

Q. Now, that dolomite is quarried dry there, is it not?

(Testimony of L. H. Duschak.)

A. Well, the dolomite is somewhat moist. If it is raining when it is quarried it is wet when it is quarried.

Q. Well, when it is not raining.

A. I don't know what you mean by "quarried dry."

Q. I will put it this way to explain what I mean: As a rock is blasted and falls to the floor of the quarry, or as it is lifted by the power shovel into a truck and dumped, or as it is dumped out of the truck into a stockpile, doesn't an exceedingly large, white cloud rise into the air?

A. There is some [275] cloud of dust produced, but I wouldn't describe it as a large white cloud.

Q. Well, how large would you describe it to be?

A. Well, we are dealing with something that it is rather hard to express in quantitative terms. It isn't a cloud of sufficient density to completely obscure objects beyond it, but it is a cloud that subsides rather quickly and does not, in general, travel for any great distance.

Q. This Defendant's Exhibit No. 10 shows a power shovel at a face of the quarry. Do you recognize it? A. Yes.

Q. Does the face of the quarry have to be broken down for the shovel to bite into, or does the shovel bite into it in its natural state?

A. No, the rock is usually broken by the use of powder before the shovel operates on it.

Q. So the first step in the quarrying operation is blasting, isn't it? A. Yes.

(Testimony of L. H. Duschak.)

Q. And when a hole or round of holes is shot off, does it raise a cloud there?

A. It throws up a little dust, yes.

Q. As the shovel picks up that broken dolomite and loads it into a truck, does a cloud of dust rise?

A. Well, there is some dust formed as the shovel dumps its load into the truck.

Q. Anyway, the broken down dolomite presently arrives at a rock crusher, doesn't it? A. Yes.

Q. And to what size has it broken down in there when it comes out of the rock crusher, what size is it?

A. I believe it is [276] minus one inch, although I think at times they crushed to minus two inches.

Q. It comes out of there in pieces?

A. In lumps.

Q. Lumps up to 1 or 2 inches in size?

A. Yes, ranging down to fine pieces.

Q. Are those lumps picked up in the next stage in the process and pulverized in any way?

A. No.

Q. What causes flow through these kilns laying along the ground?

A. I don't understand your question.

Q. I will put it this way: In this Defendant's Exhibit A—I think it is called a flow sheet—it presently shows dolomite flowing out of the crusher. From the crusher are those 1 and 2-inch lumps lifted up?

A. Yes, there is a belt conveyor system to a stock bin.

(Testimony of L. H. Duschak.)

Q. Is that an open belt conveyor out in the atmosphere?

A. I believe that is an unhoused belt conveyor, yes.

Q. And it is then dumped into what you call the stock bin? A. Yes.

Q. Just dropped down?

A. Well, it is—actually, it is dumped onto the stock pile in the bin. It is piled in the bin, and there is a tunnel running underneath the pile in which the belt conveyor operates and the material to be fed into the kiln is reclaimed from the stock pile by this conveyor.

Q. Then the material from that time on moves or flows horizontally, doesn't it?

A. No, the belt conveyor can carry it up at a considerable angle.

Q. Well, at what stage and how do these 1 and 2-inch lumps of dolomite become broken down or crushed into these minute particles?

The Court: When it goes into the furnace?

The Witness: You are referring now to the formation of these dust particles?

Mr. Naus: I am thinking of those——

The Court: Pardon me, so I may follow you. You are speaking of this material when it goes to the furnace?

Mr. Naus: Yes.

A. A belt conveyor carries it from the small stock bin from which it goes through weighing devices and then down and is fed into the upper end

(Testimony of L. H. Duschak.)

of the kilns in lump form, if you like—lumps ranging from a very small particle up to one or two inches; and if I understood Mr. Naus' question, it was as to the generation of these very fine particles.

Mr. Naus: Correct.

A. My answer to that is that they are formed within the kiln by the abrasion of the particles one against another, and they are mechanically moved in the kilns, and as a result of the action of heat, the flame, on the particles, on the lumps.

Q. That produces the dust. The product proper then goes through the whole process in one- to two-inch sizes, doesn't it?

A. Well, many of the larger lumps are broken up into smaller pieces, so that, in general, calcined material discharged from the [278] lower end of the kiln is smaller on the average than the feed.

Q. About what size is the final output?

A. Oh, I have seen particles half an inch in diameter; ranging from that down.

The Court: Q. After it goes through the kiln?

Q. Yes, the discharged material—the calcined material.

Mr. Naus: Now, this dolomite is very low specific gravity, isn't it?

A. It depends on what you would take as your standard of specific gravity.

Q. I will put it this way, perhaps concretely: What would be the cubic contents of a ton of it in its natural state and place in the quarry?

(Testimony of L. H. Duschak.)

A. I would have to work that out; I don't have that figure in mind. Its density as compared to water is something over 2; that is a cubic foot of dolomite will weigh something more than twice as much as a cubic foot of water. It will weigh perhaps a couple of thousand times as much as a cubic foot of air. So when you ask me whether it is heavy or light, I say you have to tell me what you wish me to compare it with.

Q. Compare it with granite.

A. With granite?

Q. What is the ratio?

A. I can't give you that off-hand. It is less dense than granite.

Mr. Naus: May I have this marked for identification, if the Court please?

(The photograph referred to was marked Plaintiffs' Exhibit No. 10 for Identification.)

Mr. Naus Q. I show you Plaintiff's Exhibit 10 for identification, a photograph that Mr. Harrington gave me some time back. You recognize that generally, do you not, as the stacks of the Permanente plant at Natividad? A. Yes.

Q. Now, have you ever observed issuing from the top of the stacks a white cloud of similar appearance to what you see there? A. Yes.

Q. All right. What does that white cloud consist of, the thing that gives it the color, the appearance of whiteness?

A. I presume that the whiteness is due entirely

(Testimony of L. H. Duschak.)

to the presence of minute particles of dolomite and some of these partially calcined particles or fully calcined particles that have been recarbonated.

Q. This gas you speak of is invisible in the atmosphere, isn't it, after it is discharged into it?

A. The carbon dioxide and nitrogen, and so on——

Q. Whatever gases you spoke of that were in this gas stream.

A. Yes, they are invisible; but very often there is enough water vapor in stack gas so that when it comes out to the outer air, it condenses and forms what we commonly know as a steam cloud. I couldn't say from observation whether part of that whiteness might not be due to what we commonly call steam.

Q. The dust as it comes out of the top of the stack in volume and appearance is like that photograph?

A. In a qualitative way, I think that is a fair representation. [280]

Q. I am asking about a quantitative way as well.

A. I can't answer looking at the photograph. There is nothing more deceptive than what we call smoke clouds. It all depends on the background. There are times when you can't see a very considerable cloud because of the background. If you use a different filter on your camera you will get a different contrast, so I am utterly unable to tell you qualitatively what this photograph means.

Q. I will put it this way: Assuming the plant

(Testimony of L. H. Duschak.)

down there running at a rate that caused 56 to 76 tons of dust per day to issue from the top of the two stacks, would that dust create the appearance of a white cloud something like you see in that photograph? A. Yes, something like that.

Q. Quantitatively and qualitatively?

A. When I qualify it by saying "something like that," I am not making a quantitative statement.

Q. As I understood it, you were not able to fix the dates of these other photographs that Mr. Moore put in evidence the other day?

A. No, I had nothing to do with the taking of them. [281]

Q. Now, you were handed here about two o'clock Plaintiffs' Exhibit 8 for Identification; that is the monograph that you referred to earlier today as the one you had read and studied with respect to the effect of dust on bloom, isn't it?

A. I didn't refer to it as a monograph; I referred to it as an article.

Q. That is a monograph, isn't it, and it is also an article, isn't it?

A. It is simply one of a number of articles that appeared in a certain volume of a certain journal. We don't ordinarily call those monographs. It is immaterial; you can call it a monograph if you like.

Q. If you would rather call it an article I will call it an article. Is that the article you are referring to? A. Yes.

Q. As I recall it, it is the only one that you re-

(Testimony of L. H. Duschak.)

ferred to this morning. Was there any other that you studied?

A. Oh, I referred to a number of publications of the California Department of Agriculture—that is, the University of Agriculture.

Q. But you recall you did not refer to a single one from that source that dealt specifically with the study of the effect of dust upon bloom?

A. That is correct.

Q. Now, you recall, don't you, that this article here, Plaintiffs' Exhibit 8 for Identification, is the only article you have thus far identified as dealing specifically with the effect of dust on blooms?

A. That is correct. [282]

Q. Do you know of any other?

A. No, I do not.

Q. All right. Then in all the reading and study that you have made of this subject preparatory to answering Mr. Moore's questions this morning, this article now in your lap, the exhibit for identification, is the only article you ever read or studied in your life on the subject dealing specifically with such a study, isn't it?

A. Well, if you are limiting your question to the effect of dust on the blossoms of certain fruit trees—if that is the meaning of the question, the answer is Yes, this is the only article that I have perused on that subject.

Q. And you have never made any study within the field of that article—any personal study or experiments?

(Testimony of L. H. Duschak.)

A. No, I have never made any experiments.

Q. Do you agree or disagree with the opinions, conclusions, and statements of the author of that article?

A. I would agree with some, and I think I might take exception to some.

Q. As a matter of fact, that article relates to cement dust, doesn't it? A. Yes.

Q. Aren't the main ingredients of the substance that produces the cement dust present in dolomite?

A. No, only one.

Q. Which one do you have in mind?

A. The calcium. There are other ingredients in cement dust.

Q. All right. The author of that article is Anderson? A. Yes. [283]

Q. Doesn't Anderson trace the injurious effect of the cement dust upon fruit tree blossoms to the calcium ingredient?

A. The calcium in the form of calcium hydroxide; that is, in its caustic form, if you like. And he states further that when that calcium hydroxide has absorbed carbon dioxide and become neutralized, that it doesn't interfere appreciably with the dissemination of the pollen.

Q. Getting back to my question, I am trying to find the ingredient of the substance that produces cement dust that Anderson traces the injurious effects to, and the answer is calcium carbonate, isn't it?

A. No, the answer is calcium hydroxide.

(Testimony of L. H. Duschak.)

Q. To calcium carbonate in the ore itself?

A. I beg pardon?

Q. It is calcium carbonate when mined or quarried in the first instance?

A. Yes, the raw material from which cement is made includes calcium carbonate—limestone.

Q. And you find this calcium carbonate or raw material in this dolomite mined in Natividad?

A. Yes, calcium carbonate is one of the constituents of dolomite.

Q. One of the two major constituents, isn't it?

A. Yes.

Q. Now, in Anderson's study, wasn't that raw material simply calcined or roasted to produce cement dust?

A. The limestone was mixed with other materials and finely ground, and then fed into a kiln for the purposes of burning.

Q. As a matter of fact, isn't the simple statement of the [284] process the breaking down of the raw material that produces the cement dust—the breaking down of the raw material out of the quarry, and to use a chemical term, it was calcined, or a metallurgical term, it was roasted?

A. No. The essential in cement-making is the formation of the clinker causing the silica, alumina and iron and calcium to combine in certain forms. The calcination is an intermediate step.

Q. Nevertheless you will agree with this statement: that Anderson, after the full study that he made and experiments and tests that he made, in

(Testimony of L. H. Duschak.)

tracing out the source of injury to fruit orchards, traced it to the substance that was originally calcium carbonate in the quarry? A. Yes.

Q. Now——

A. May I make a little further explanation? I would rather say that Anderson showed that a substance which could be produced from the calcium carbonate of the quarry was, in his opinion, responsible for failure of pollen to grow in certain circumstances.

Mr. Naus: Well, I will offer the article if there is any question as to what Anderson says.

Mr. Moore: I have no objection.

Mr. Naus: I ask that the reading be waived at this time.

Mr. Moore: Yes.

(Plaintiffs' Exhibit 8 for Identification was received in evidence.) [285]

PLAINTIFFS' EXHIBIT NO. 8

THE EFFECT OF DUST FROM CEMENT MILLS ON THE SETTING OF FRUIT

Paul J. Anderson

Cornell University, Ithaca, N. Y.

Fruit growers in the vicinity of Hudson, New York, in the spring of 1910 complained that their crops were seriously damaged by dust from large cement mills which had recently been located there. They noticed particularly a decrease in the amount

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

of fruit that was set on trees within the dust zone. They also feared permanent injury to the foliage and young shoots. The investigations recorded below were undertaken in order to determine the nature and extent of the alleged injury and, if possible, to find a remedy.

Appearance of the foliage. The foliage in the dust zone is covered with a fine, gray, gritty dust mixed with minute black granules (evidently cinders). The coating is heavier near the mills but is plainly noticeable at a distance of two miles. A greenhouse located a mile away was so heavily coated within a month after the plant started operations that the passage of light through the glass was seriously interfered with. Hard rains wash the coarser part of the dust from the leaves and while they are wet they appear green, but, on drying, become white again from a thin film which cannot be washed off. On a rigid surface, however, such as a greenhouse roof, the dust collects and sets very rapidly, forming an opaque covering which can be removed only by the use of acid. Under certain weather conditions the same hard crust is formed on the leaves and remains on them throughout the season.

Source of the dust. That the dust comes from the mills—not from the roads or soil—is evident from the following considerations: (1) It is found nowhere else except in an area about the mills; (2) it falls just as heavily when the ground is

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

soaked and the roads muddy from hard rains; (3) it does not look or feel like road dust; (4) it gives an alkaline reaction with phenolphthalein, which is not true of any other dust sample collected in that county; (5) its chemical composition (given below) shows it to be a partially burned dust.

A study of the mills in operation showed that there were two main sources from which a large amount of dust came: (1) The crushing pulverizing and drying mills, where the raw mixture of limestone and shale is reduced to an extremely fine,

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

TABLE I.

CHEMICAL ANALYSIS OF DUST SAMPLES

	Cement Dust From Pulverometer	Cement Dust From Raspberry Bushes	Road Dust	Road Dust (Macadamized)	Soil Near Pulverometer	Atlas Portland Cement
*Number of sample.....	1442	1452	1453	1495	1451	
Silica (SiO ₂)	20.32	21.14	61.06	40.60	75.42	23.50
Iron and alumina						
(Fe ₂ O ₃ + Al ₂ O ₃)	10.52	11.26	10.86	8.66	13.90	10.04
Lime (CaO)	42.25	44.12	10.83	24.05	0.93	62.08
Magnesia (MgO)	1.02	1.04	2.26	1.30	2.30	1.23
Sulfur trioxide (SO ₃).....	1.24	0.27	0.15	1.85	0.13	1.63
Loss by ignition.....	22.49	20.33	13.20	23.40	5.86	1.30
Total	97.84	98.16	98.36	99.86	98.54	99.17
Carbon dioxide (CO ₂)	not determined	12.10	not determined	18.90	not determined	
Insoluble (in hot HCl).....	21.00	19.41	70.96	50.59	90.07	not deter- mined

* Sample book of the chemical laboratory of the Atlas Portland Cement Company, Hudson, New York.

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

dry powder (technically called composition); (2) the stacks of the kilns in which the composition is burned and fused to clinker (unground cement). The second is undoubtedly the principal source of the dust on the foliage because: (1) The strong draft in the kilns, produced by the burning, powdered coal and air forced in below under a pressure of 100 pounds to the square inch, must necessarily carry some of the dry, fine composition dust out of the top of the stacks; (2) the distance to which the dust is carried points rather to the high kiln stacks and forced ejection rather than the low pulverizing and drying mills; (3) chemical analysis shows that the dust on the foliage has been partially burned.

Amount of the dust. A simple "pulverometer," for collecting and measuring the amount of dust, was made by supporting upright a large tin funnel (2 feet in diameter at the top) with a detachable, tight-fitting, glass cylinder at the bottom, into which the dust collected or was brushed down from the sides of the funnel. From the amount of dust caught in the cylinder (knowing the area of the mouth of the funnel) it is easy to calculate the amount of dust that falls on an acre. An average record (August 22, 1910) when the wind was blowing toward the pulverometer, gave 167.6 pounds of dust deposited on an acre in twenty-four hours, or $2\frac{1}{2}$ tons of dust per acre in a month. But actually, no acre in the vicinity of the mills receives this

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

TABLE II.

Analysis of Cement Dust Collected in the Pulverometer
August 22, 1911.

Analyzed by Prof. Enrique Touceda

		Soluble in Water	Insoluble in Water
Silica	21.94	0.23	21.27
Iron and alumina	9.10	0.44	8.73
Lime	46.65	7.81	38.99
Magnesia	1.17	0.078	1.10
Carbonic anhydride	17.50		
Comb. water and organic	3.64 by dif.		
	<hr/>		
	100.00%		

amount because the wind does not blow constantly from one direction.

Chemical analyses. Numerous chemical analyses were made of the dust collected as above and also of dust shaken from the raspberry bushes a quarter of a mile distant from the mill. Average samples of these analyses are given in table I (samples 1442 and 1452). For comparison, there are also included in this table analyses of (1) soil near the pulverometer, (2) average sample of Portland cement, (3) two samples of road dust, No. 1453 a road dust sample taken at random near the mills, and No. 1495 from a recently macadamized road where the percentage of limestone was high.

Table II gives an analysis of cement dust collected from the same locality and analyzed by Prof. Enrique Touceda of the Troy Polytechnic Institute.

Three points should be noticed in these analyses:

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

(1) The soil and road dust sample show such striking differences from cement dust in the proportion of constituents that neither of them could possibly be the source of the dust on the leaves; (2) a large part of the limestone in the cement dust has had the carbon dioxide removed and the lime is left in the caustic condition. Sample 1452, for instance, contains 12.10% of carbon dioxide. If the lime and magnesia here were in the form of a natural limestone i.e., calcium and magnesium carbonates, as they are in the road dust sample 1495—the dust should contain 37.78% of carbon dioxide. In other words, over two-thirds of the limestone has had the carbon dioxide removed from it—a condition which could be brought about only in the kilns. (3) Nearly 8% of the dust is lime that is soluble in water. The soluble lime is the cause of the extreme alkalinity of the dust and, as will be indicated below, is probably the source of injury to the fruit blossoms.

Less fruit on the dusted side of the trees. Our first observations were in the summer of 1910. During the entire blooming season of that year, a continuous south wind blew the dust from the mills onto a cherry orchard where our laboratory was established. The blossoms on the south side of the tree were literally plastered with dust while those on the north side were more or less protected. When the fruit was about half grown, the number of cherries on each side of eighteen trees were

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

counted and there was found to be 29% more fruit on the north side than on the south side of the trees. The same number of trees outside the dust zone were counted as a check and it was found that there was a difference of only 2.2% in the number of cherries on the south and north sides and that in favor of the south side. This led us to suspect that the dust did in some way influence setting of the fruit.

Dusting experiments. During the blooming season of the next year (1911) the mills were temporarily closed. Therefore it was necessary to depend on artificial dusting for our experiments. This however was really an advantage since it offered the opportunity of having dusted and untreated check blossoms all on the same tree, making the conditions entirely equal. Sweet cherry, sour cherry, pear and apple trees were used. Two branches were selected from each tree which were as near alike in size, position, etc. as could be found. Cement dust, which had been collected from foliage the previous summer and had been kept in air-tight bottles, was blown over the blossoms of one of the branches as soon as they opened, while the blossoms on the other branch were left untreated. When the fruit was about half grown, the number which had set on each branch was counted. The cherries and pears were dusted twice each day; the apples on the other hand, only at irregular intervals. The results from the latter are included in the table

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

TABLE III.

Shows the Number of Treated and Untreated Fruit
Blossoms Which Set Fruit

	Dusted			Untreated		
	Blossoms	Fruit set	Percent	Blossoms	Fruit set	Percent
Sweet cherries	1618	24	1.48	1767	582	32.93
Sour cherries	1536	122	7.94	1975	1287	65.16
Pears	2908	11	0.37	3181	587	18.43
Apples	1126	67	5.95	1507	752	49.90

below to show that even an occasional dusting is injurious. In each case, ten to twenty branches were treated, but in the table, the total number of blossoms is given for all the branches that received the same treatment.

From Table III it will be seen that only a very small percentage of the blossoms that had dust blown over them set fruit. It will be asked why any of the fruit at all set when the blossoms were all dusted. In the first place, all of the blossoms may not have been reached by the dust. In the second place it is known that the growth of the pollen tube is very rapid in warm weather and it is quite likely that some of the blossoms were already fertilized when the dust was applied. It is not certain but that in the latter case the fruit would set normally.

It should be mentioned in this connection that for some time after the falling of the petals, no difference could be observed between fruits on treated and untreated branches. Both kinds grew

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

at the same rate. Often it was ten days to two weeks after blooming before any difference became noticeable. Then the unfertilized fruit stopped growing and soon dropped.

Nature of the injury. Having demonstrated that dust did prevent setting of fruit, the next question to arise was: what is the injurious constituent in the dust and how does it act on the flower? A "cement dust solution" was made by shaking up a quantity of dust in distilled water and then letting it set for several hours in order to allow any soluble parts to go into solution. This was then filtered and the filtrate applied to the flowers as a spray. It prevented setting of fruit almost as effectually as the cement dust itself. As indicated by the analyses there is only one thing in the dust that goes into solution to any appreciable extent and that is lime. It was reasonable then to infer that the latter was the injurious part of the dust. A solution of pure lime was made and applied in the same way. The results were the same as those secured by spraying the flowers with cement dust solution.

In another series of experiments, the blossoms of some large lillies in the greenhouse were used. Cement dust was applied to the stigmas only and then they were pollinated by hand. Checks were pollinated but not dusted. One hundred per cent of the checks set but none of those flowers which were dusted produced seed. From these experi-

(Testimony of L. H. Duschak.)

Plaintiffs' Exhibit No. 8—(Continued)

ments it was concluded that the lime of the dust affected the stigma or the stigmatic secretions in such way as to interfere with fertilization and thus prevent setting of the fruit.

It is a well known fact that the stigmatic secretions of most plants are acid in character. One may easily demonstrate this point by moistening a piece of blue litmus paper and merely touching it with the stigma of a cherry blossom. A pink spot will appear on the paper at every point touched. If a minute quantity of the cement dust is placed on the stigma, however, it no longer gives this reaction but becomes alkaline due to the lime which is dissolved in the secretions. This is what takes place when the dust from the mills settles over the orchards. What is the effect of this change on germination of pollen? Will pollen germinate at all in an alkaline calcium solution? To determine this point, artificial pollen germination tests were made.

Pollen germination tests. The method used for germination was this: A definite weight of cement dust, collected from the leaves, was placed in a flask and a measured volume of distilled water added, well shaken and permitted to stand over night, then filtered. After determining the strength of sugar solution required—differing for almost every species tried—the required weight of saccharose was dissolved in the filtrate. Check solutions of saccharose of equal strength were made in the same way

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TABLE IV.

Shows Results of Comparative Germination Tests of Sweet and Sour Cherry Pollen in Cement Dust Solution and Check Sugar Solutions. Strength of Dust Solution 1-170 Cherry Pollen.

Strength of Sugar Solution	Check		Cement Dust	
	Sweet Cherry	Sour Cherry	Sweet Cherry	Sour Cherry
2%	7%	8%	0	0
3%	9%	13%	0	0
4%	13%	17%	0	0
5%	19%	27%	0	0
7%	17%	23%	0	0
10%	17%	29%	0	0
12%	18%	7%	0	0

by using distilled water instead of the dust solution. Pollen from freshly opened anthers was put in drops of these solutions on slides in moist chambers. Checks were always run on the same slide as the tests in order to make conditions the same.

Cherry pollen. The first artificial germination tests were made during the winter of 1910-11. Twigs of both sweet and sour cherry were brought into the greenhouse and placed in a jar of water, where they bloomed. In testing the pollen thus secured, various strengths of sugar solutions were used in a solution of the cement dust 1-170 (i.e., 1 g. of dust to 170 cc. of water). The results are given in Table IV.

During the blooming season of 1911 the experiments were repeated with pollen which matured naturally on the trees. The results practically duplicated those given above. The writer has not been

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able to explain satisfactorily the low percentage of germination in the checks. A possible explanation is that they required an acid solution, while we were using a neutral one. No germination whatever was secured in the cement dust solution.

TABLE V.

Shows Apple Pollen Germination. Counted
After Eighteen Hours

Strength of Sugar Solution	Cement Dust Solution 1-100		Distilled Water Check	
	Per cent germination	Length of tubes	Per cent germination	Length of tubes
2%	0	0	64	6
5%	0	0	67	7
7%	0	0	76	7
10%	3	3	98	25
12%	1	2	95	20
15%	0	0	87	15
17%	0	0	83	15
20%	0	0	63	10
25%	0	0	53	4

Pear pollen. Better success was obtained in artificially germinating the pollen of pears. Solutions of 20, 22 and 25% saccharose were used and between 65 and 75% germination was constantly secured in the checks but none at all in the 1-100 cement dust solution.

Apple pollen. This was the most satisfactory set of experiments. The blooming season of the apple is longer and gave more opportunity for an extended set of experiments. Table V shows the results of tests where various concentrations of saccharose were used. The optimum concentration, as

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indicated here, was 10%. This concentration was therefore used in the further tests. Germination in the dust solution of 1-100 was practically nil.

Table VI gives the results of tests in which the concentration of the dust solution was decreased to 1-300. Even here there was very little germination.

Calcium a toxic agent. It has been mentioned previously that in the writer's opinion it is the alkaline calcium salt which presents germination. That such is the case is very strongly indicated by the following experiment. When a drop of the cement dust solution is permitted to remain exposed to the air for an hour or two, the greater part of the calcium crystallizes out in the form of calcium carbonate. If tested when exposed, the drop gives an immediate alkaline reaction with phenolphthalein; several hours later there is no reaction, showing that the carbon dioxide of the air has completely neutralized the alkaline salt. Now if the pollen grains are put

TABLE VI.

Tests With Various Concentrations of the Cement Dust Solutions. All Solutions of 10% Saccharose. Checks Same as the 10% Solution in the Preceding Table.

Strength of Solution	Percent Germination	Length of Tube
1-100	2.5	1.5u
1-150	2.0	4.0
1-200	3.0	5.0
1-250	3.5	4.0
1-300	4.0	3.0

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to germinate at once there is practically no germination, as given in the table above. If, however, the drop is allowed to stand until neutralization occurs and the pollen then put in, it germinates almost as well as the checks. Numerous tests of the substance which crystallized out failed to show anything present except calcium carbonate. If then this is the only substance which it is necessary to remove in order to get germination, the conclusion is inevitable that this is the toxic substance. It must not be understood, however, that all the calcium crystallized out. Even after remaining exposed to the air for a long time, some calcium in the solution can be brought down with ammonium oxalate. This calcium is probably in the form of bi-carbonate and therefore gives no reaction with phenolphthalein, nor does it seem to be toxic to the apple pollen. In fact apple pollen germinates in tap water which contains a relatively large amount of calcium almost as well as it does in distilled water.

Raspberry. This was not the case with the raspberry pollen which was next used. When the solutions for this experiment were made with tap water, 18% germination of the grains was secured, while with distilled water 83% germinated. The germ tubes in the former were not as long nor as vigorous. Tests of this same pollen were made in the water after the calcium had been crystallized out as previously, but here the germination was reduced to 11%; this shows quite a different result

(Testimony of L. H. Duschak.)

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from that obtained with the apple pollen. In this case the calcium is evidently toxic whether in the caustic condition or not.

The raspberry pollen experiments were to determine two points: (1) How weak a solution of the cement dust will prevent germination? (2) How weak a solution of calcium oxide will prevent germination? Raspberry pollen germinated very readily in 30% saccharose. No check gave less than 90% germination. Solutions of the cement dust were made up 1-500, 1-700, 1-800, 1-1000, 1-1200, 1-1500, 1-1600, 1-1800, and 1-2000. After filtration these were used to make 30% saccharose solutions. Up to 1-1500 there was no germination except for an occasional short tube. Above this, slight germination occurred, reaching 6% in the 1-2000 solution. But even here the tubes were rarely more than four times as long as the diameter of the grain, while in the checks in the same period of time, they were thirty times the diameter of the grain. The results of the second series is given in the following table.

TABLE VII.

Shows the Comparative Germination of Red Raspberry Pollen in Different Concentrations of the Cement Dust Solution

	Strength Ca (OH) ₂							
	0.1	0.2	0.05	0.02	0.01	0.005	0.002	0.001
Per cent of germination	0	0	0	0	0.5	1.5	3.0	7.0

An extremely small amount of lime is evidently sufficient then to prevent germination. The writer

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had hoped to test out all the other constituents of the dust but has not found opportunity to do so. It is possible that other substances in the dust may go into solution in the acid stigmatic secretions to an extent sufficient to prevent pollen germination. Whether this be so or not, it is certain that the injury from the lime alone is sufficient to account for the damage.

Work of Professor Beach. There should be mentioned at this point the work of Professor Beach¹ who investigated the effect of spraying fruit trees in bloom. Artificial germination tests in the laboratory were used here also. Two paragraphs are quoted from Professor Beach's bulletin in which are given the results of his investigation.

From page 433 of that bulletin:

From these investigations it appears that if before pollination occurs, the stigmatic surface of the pistil should be covered either with bordeaux mixture alone or with arsenical poison alone, of the strength commonly used in spraying orchards, there would be no germination of any pollen which might afterwards reach the stigmatic surface and so fertilization would be prevented and no fruit would be formed. Even the presence of lime alone, of the strength commonly used in spray mixtures, prevented the germination of pollen. Bordeaux mix-

¹ Beach, S. A. and Bailey, L. H. Spraying in bloom. New York (Geneva). Agr. Exp. Sta. Bull. 196. 1900.

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ture was diluted in aqueous sugar solution to 500 parts, 200 parts, 100 parts, 50 parts, 2 parts, and 1 part in 10,000 of culture media into which various kinds of pollen were introduced. Even when diluted to 50 parts in 10,000 it prevented germination to large extent and where germination did occur the growth which followed was decidedly slow and the pollen tubes were dwarfed. When diluted to 100 parts, 200 parts, or 500 parts either no germination or practically none was found.

Also on page 442:

In the tests where the trees were sprayed repeatedly during the blooming season so as to hit as many as possible of the new blossoms which opened from day to day, but very few blossoms survived the treatment and consequently but little fruit set. This shows that the ordinary spray mixtures surely prevent the setting of fruit when applied to the blossoms soon after they open.

The principle apparently is the same in these cases as in that of the blossoms covered with cement dust, i.e., lime is the toxic ingredient. About the only difference between spraying the flowers with these mixtures and dusting them with cement dust is that in one the lime is in water while in the other it is dry.

SUMMARY

We may briefly summarize the results of the investigation:

1. Dust from the cement kiln stacks settles on

(Testimony of L. H. Duschak.)

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the vegetation within a radius of two miles from the mills.

2. This dust contains a large amount of alkaline, soluble calcium salts.

3. When the dust falls on the fruit blossoms some of it goes into solution in the stigmatic secretions and pollen falling on the stigma will not germinate. Thus the flowers will not be fertilized.

4. Artificial germination tests show that pollen will not germinate even in very weak solution of the dust.

5. When the blossoms are dusted as fast as they open, only a very small percentage sets fruit.

[Endorsed]: Filed 9-14-44.

Mr. Naus: Q. As you sit there today, and after any and all research you may have made, are you able to assist this Court at this time by pointing to any other published study of the effect of dust falling upon a fruit orchard?

A. No, I think not.

The Court: You mean any other publication?

The Witness: Well, I understood Mr. Naus' question to refer to this limestone dust. I could refer to publications dealing with the effects of smelter dust.

Mr. Naus: No, not smelter dust.

(Testimony of L. H. Duschak.)

The Witness: Well, I understood your question to mean——

Mr. Naus: Q. Cement, dolomite dust, and that kind of dust.

A. Yes, I understood your question to be restricted.

Q. I don't mean gas fumes; I mean dust.

A. I am talking about dust that comes from smelters—from copper and lead smelters. There are publications dealing with that subject.

Q. That gets into the field of something else.

A. Those are dealing with materials other than those we have been discussing here.

Q. Are you familiar with Heald's "Manual of Plant Diseases"? I am trying to keep this open at one page, 201.

A. Yes, I have seen the volume. I would hardly say that I was thoroughly familiar with it.

Q. Is it a sound book?

A. I think it is regarded as one of the standard works on the subject. [286]

Q. It is one of the texts in that field, isn't it—teaching texts? A. Yes.

Q. Now, I invite your attention to Chapter X beginning on page 201, including the bibliography at the end which refers only to Anderson, and ask you whether or not——

Mr. Moore: Pardon me, Mr. Naus. Are you offering it or having it marked so that in cross-examining we can see it?

(Testimony of L. H. Duschak.)

Mr. Naus: I was just in the middle of framing a question which I had not completed.

Q. After drawing your attention to that I will ask you if you consider that Heald's teaching text is misguided or erroneous in accepting Anderson's study as the basis of modern university and college teaching on the subject.

Mr. Moore: I am going to object to the question as argumentative, your Honor.

The Court: Anything that would assist the Court in any way in connection with the problem which is presented is allowable.

Mr. Moore: I will withdraw the objection.

Mr. Naus: May I have the question read, your Honor?

The Court: Read the question.

(Question read.)

A. I am inclined to think that you are assuming something somewhat contrary to the fact in saying——

Mr. Naus: I don't think so. [287]

Mr. Moore: Please let the witness reply.

The Court: Let him finish.

A. (continuing)—that Heald adopts that as the basis of teaching. I haven't yet read this chapter.

Mr. Naus: Q. Just that one page is all you need to read.

Mr. Moore: You asked him his expert opinion. Give him a chance to read it.

Mr. Naus: Mr. Moore, he can take the book home and sleep with it. I don't want to rush him.

(Testimony of L. H. Duschak.)

Mr. Moore: That is just the reason I ask that it be put in evidence and be marked.

Mr. Naus: The book doesn't belong to me; otherwise I would.

Mr. Moore: I will agree that it may be withdrawn, but I do think if you are examining the witness in regard to a certain text, whether the book belong to you or not, it ought to be introduced.

Mr. Naus: It is a book that can be introduced now?

Mr. Harrington: I promised to return it.

Mr. Naus: Immediately? He seems to be in doubt, so I will ask that the book be marked for identification. Be it on his own head. Then it will be available for everyone.

Mr. Moore: Then I will ask that the Doctor be given time to read it over.

The Court: It is nearly time for adjournment.

Mr. Naus: He will have some reading and some figuring to do.

The Court: Is this the only book that you are going to give him?

Mr. Naus: Yes, that is all.

Mr. McCarthy: We have a copy of it, your Honor.

Mr. Moore: We have a copy of it. I didn't know it.

Mr. Naus: Would you rather mark yours?

Mr. Moore: It doesn't make any difference.

The Court: Unless you can get through with this witness—

(Testimony of L. H. Duschak.)

Mr. Naus: That couldn't possibly happen, because he still has some figuring, for one thing.

The Court: I was wondering as to the enumeration of the three problems you have got—being limited in my mathematics as well as my chemistry—how long will that take you?

The Witness: Oh, I should be able to do that in fifteen or twenty minutes. That is, those three problems on the number of dust particles. It is simple arithmetic, which I think Mr. Naus could do himself if he chose.

Mr. Naus: I know, but then, you see, I am not under oath.

The Court: There are very few things that he can't make a pretty good try at.

Mr. Naus: I am one of these ambulance chasers that letter refers to, going around and getting these farmers as clients.

The Court: We will take an adjournment. [289]

The Court: Suppose we mark your book for identification and let him take that one home and read it.

Mr. Moore: It doesn't make any difference. I didn't know Mr. McCarthy had it.

Mr. Naus: I ask that Mr. Moore's book be marked for identification.

(The book was marked Plaintiff's Exhibit No. 11 For Identification.)

(Thereupon an adjournment was taken until tomorrow, Friday, September 15, 1944, at 10:00 a.m.) [290]

